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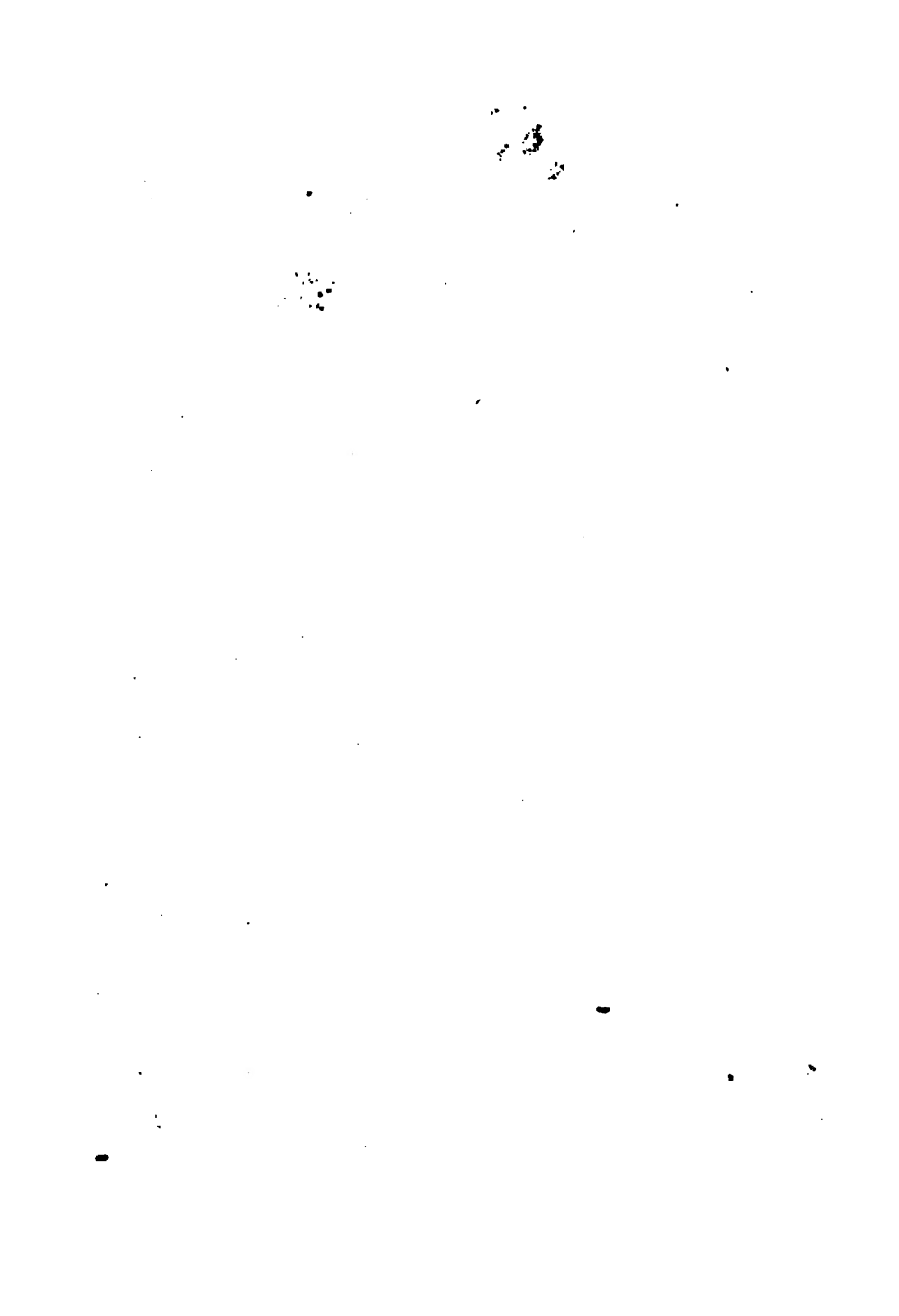
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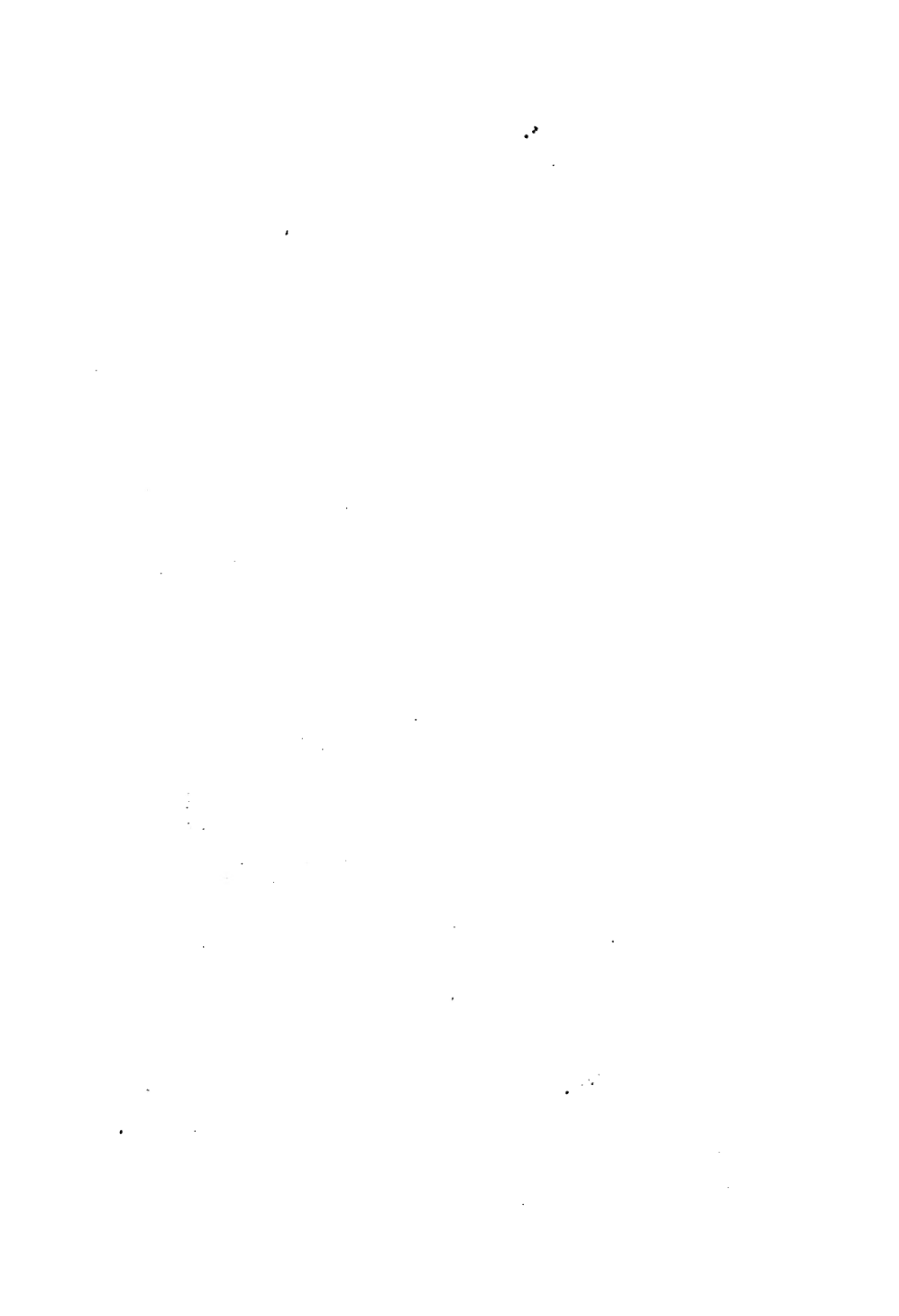


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PATENTS FOR INVENTIONS.

ABRIDGMENTS

OF

Specifications

RELATING TO THE

PRODUCTION AND APPLICATIONS OF GAS.

(EXCEPTING GAS ENGINES.)

PART II.—A.D. 1859—1866.

PRINTED BY ORDER OF THE COMMISSIONERS OF PATENTS.

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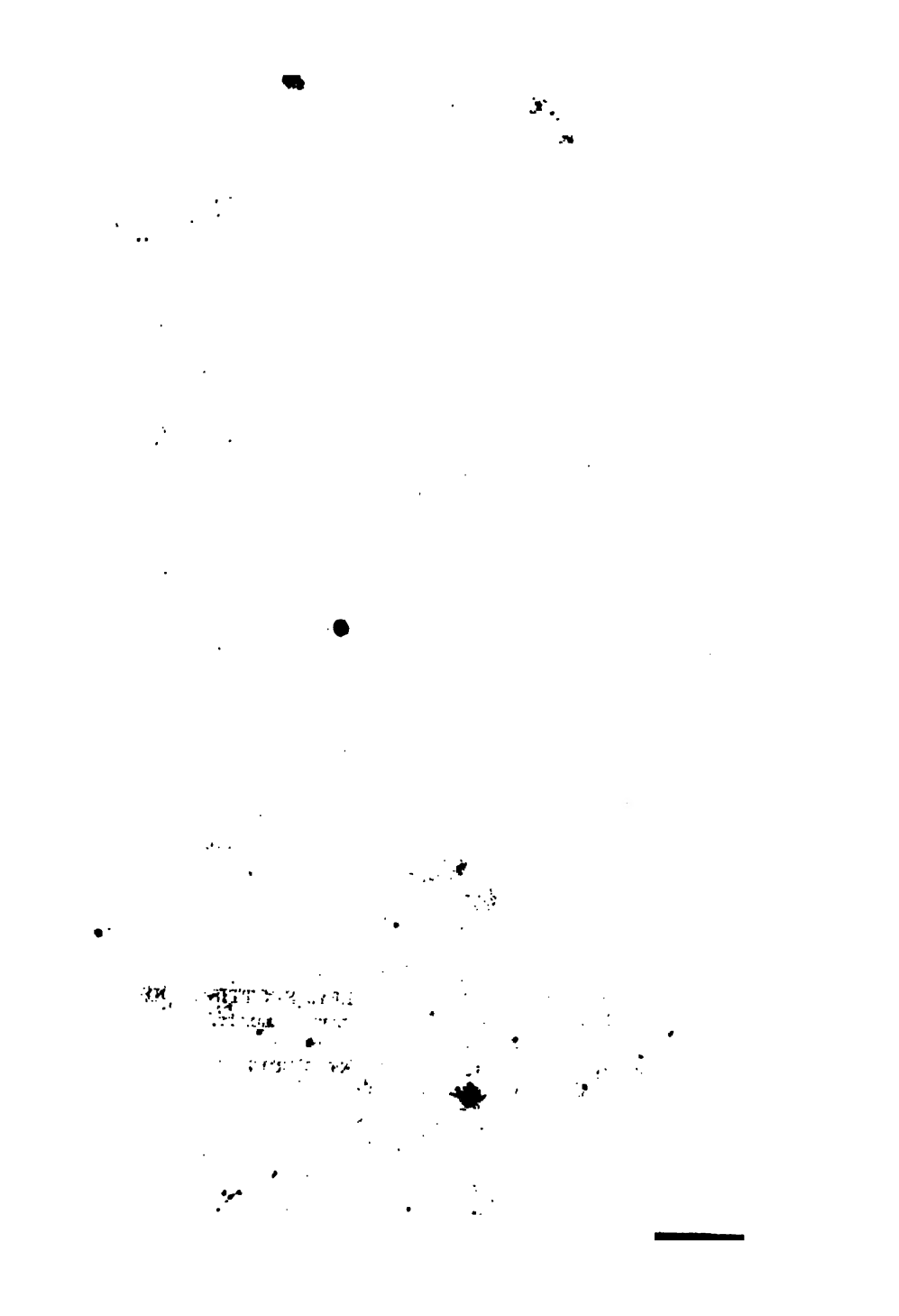
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PREFACE.

THE Indexes to Patents are now so numerous and costly as to render their purchase inconvenient to a large number of inventors and others, to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the Specifications of Patents under each head of Invention have been prepared for publication separately, and so arranged as to form at once a Chronological, Alphabetical, Subject-matter, and Reference Index to the class to which they relate. As these publications do not supersede the necessity for consulting the Specifications, the prices at which the printed copies of the latter are sold have been added.

The number of Specifications from the earliest period to the end of the year 1866 amounts to 59,222. A large proportion of the Specifications enrolled under the old law, previous to 1852, embrace several distinct inventions, and many of those filed under the new law of 1852 indicate various applications of the single invention to which the Patent is limited. Considering, therefore, the large number of inventions and applications of inventions to be separately dealt with, it cannot be doubted that several properly belonging to the group which forms the subject of this volume have been overlooked. In the progress of the whole work such omissions will, from time to time, become apparent, and be supplied in future editions.

This volume is a continuation of the "Abridgments of the Specifications relating to the Production and Applications of "Gas" already published, and brings the Abridgments to the end of the year 1866. From that date the Abridgments will be found in chronological order in the "Chronological and "Descriptive Index" *see* (List of Works at the end of this book). It is intended, however, to publish these Abridgments in classes as soon as the Abridgments of all the Specifications from the earliest period to the end of 1866 have appeared in a classified form. Until that takes place, the reader (by the ai-

of the Subject-matter Index for each year) can continue his examination of the Abridgments relating to the subject of his search in the Chronological and Descriptive Index.

This series of Abridgments embraces the inventions relating to the generation, purification, measurement, supply, and use of gas (excepting as applied to the production of motive power in gas engines, for which subject reference must be made to the series "Air, Gas, and other Motive Power Engines.") Inventions relating to glass chimneys, shades, and globes generally, will be found in the class of Abridgments entitled "Lamps, Candlesticks, Chandeliers, and other Illuminating Apparatus;" and those only are contained in this series which are described in the Specifications as intended especially for gas burners. Improvements in the production of chemical salts, dye colours, and other products of commercial value from the refuse of gas works, are not included in the present work unless they also relate to some process in the manufacture of gas, for instance, the purification of gas;—abridgments of such inventions will be found in the series to which they more immediately belong, as "Acids, Alkalies, Oxides, and Salts," "Bleaching, Dyeing, and Printing Yarns and Fabrics," and "Manure." Ordinary iron pipes and metal tubing are excluded; but pipes specially adapted for gas, as well as flexible gas tubing and joints for gas pipes, are included,—so also are the tools used in making and fixing gas fittings, and the apparatus for operating on gas mains. Exhausting apparatus employed in the manufacture of gas for illumination will be found in this series; but apparatus used for exhausting and forcing gases, air, and vapours or fumes for other purposes are omitted.

B. WOODCROFT.

October, 1875.

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THE PRODUCTION AND APPLICATIONS OF GAS.

1859.

A.D. 1859, January 1.—N° 17.

HARRIS, JAMES.—“Improvements in apparatus for regulating the pressure and flow of steam, water, and other fluids.”

The invention relates “principally to apparatuses for reducing high pressure fluids to any given pressure below that in the boiler, water main, gas main, or any other main, or for allowing steam or other fluid, when it has attained a given pressure, to escape either into a second receiver, or into the open air, through a safety valve or danger signal, or otherwise.” This is effected by means of a nozzle with inner and outer chambers, the former connected with the high pressure, the latter with the outlet. A double-seated or equilibrium valve forms the communication between the inlet and the outlet. Attached to the outer chamber is a short cylinder fitted with a piston, which has a flexible diaphragm on its inner surface, to prevent leakage, the outer surface being open to the atmosphere. The inner side of the piston is connected with the valve by a loose or ball joint. The valve is kept open by a spiral spring acting against the piston, and is closed, or partly closed, by the fluid in the outer chamber when it has attained sufficient pressure to overcome the power of the spring, the latter being adjustable by means of a screw. For allowing the steam, &c., to escape the inlet is reversed, and leads into the outer chamber, and the outlet is from the inner chamber. The valve is also in this case made to close by the force of the spring, and is opened by the fluid increasing in pressure so as to overcome the force of the spring. By attaching a piston, fitted as above, to either a small single or double seated valve in connection with a steam whistle, it becomes an almost frictionless danger signal.

[Printed, 10d. Drawing.]

G.

A.D. 1859, January 7.—N° 55.

GEYELIN, GEORGE KENNEDY. — "Regulating gas-burners, " which he calls 'Universal Gasburner's Regulator.' "

"The difference between the ordinary gas regulator with valve and this consists—1. That I interpose between the valve and the burner a perforated chamber, the holes of which will not pass more gas than is necessary for consumption under low pressure to the burner, by which means the flame of Argand, Dumas, and all other burners remain invariable under any variation of pressure. 2. To prevent the almost total closing of the valve by a very great pressure; the valve can also be perforated."

[Printed, 4d. No Drawings.]

A.D. 1859, January 17.—N° 140.

COOPER, SAMUEL THOMAS.—(*Provisional protection only.*)—"Improvements in the use and application of artificial light."

The "essential condition of this invention" is to place a burner, supplying a small jet of gas, in such a position under or near to other burners that the jet from the former being ignited, its flame shall ignite the gas from the latter when turned on. The plan is applicable for signals in lighthouses, on board ship, and for railways. The burners of the small and large pipe are placed in a lantern placed in any desired position, the valve of the large pipe being provided with a handle, by means of which the person in charge of the signal can turn the gas off and on as required. For lighthouses this may be made to produce the effect of revolving lights.

[Printed, 4d. No Drawings.]

A.D. 1859, January 20.—N° 175.

GREENWOOD, THOMAS, and BATLEY, JOHN.—(*A communication from Van der Berghe.*)—"An improvement in the process of gassing textile fabrics."

The object of this invention is to prevent the discoloration of goods subjected to the gassing operation by reason of the deposit on the fabrics of unconsumed carbon given off by the jets of flame employed to singe the loose fibres. The improvement consists "in bringing the fabrics into contact with, or close proximity to, the oxygenated portions only of the flame, which may be

“ effected by directing the gas jets towards the fabrics to be
 “ operated upon, and causing the fabrics to traverse at a proper
 “ speed, in a vertical plane, or in a plane slightly inclined from
 “ the vertical, while passing the line of flame directed against
 “ their surface. By this means a current of air, induced by the
 “ movement of the fabric under operation, is caused to pass
 “ between it and the flame, and carry off and disperse into the
 “ atmosphere all the unconsumed carbon that may arise from
 “ the combustion of the gas.”

[Printed, 4d. No Drawings.]

A.D. 1859, January 21.—N^o 192.

DAVENPORT, ALFRED.—(*A communication from Henry Woodward.*)—“ An improved regulating burner for gas.”

In the interior of the jet are two cones, the lower one enclosing the top of the pipe, and being provided with a very small opening at its apex. The upper cone is closed at the apex, and is provided in the interior with a brush or tuft of metallic wire covering the opening in the apex of the lower cone. The upper cone has a flange at its base, fitting the interior of the burner, and provided with three or more lateral openings to allow of the passage of the gas through a disc of wire gauze at the apex of the upper cone, fitting the interior of the burner.

[Printed, 6d. Drawing.]

A.D. 1859, January 24.—N^o 217.

WARNER, ARTHUR, and TOOTH, WILLIAM.—“ Improvements
 “ in the manufacture of iron and gases for such and other uses.”

“ In the manufacture of iron in blast and cupola furnaces, jets
 “ of liquid hydro-carbons are forced in by means of forcing-
 “ pumps or apparatus, or by the pressure of a column. In
 “ carrying out this part of our invention, we cause jets of hydro-
 “ carbons, such as common gas, tar, oils or resins that are in or
 “ can be reduced to a liquid state by heat, to be forced into the
 “ blast or cupola furnace through or by the blast or tuyer pipes
 “ or pipe, so that it may enter with the blast, and come in contact
 “ with it, and produce combustion with the oxygen it contains as
 “ it is entering the furnace, or such partial combustion, and in
 “ such quantities as will prevent the oxygen coming in contact
 “ with the iron without the presence of hydrogen and carbon in

“ conjunction with each other or separately. For this purpose
 “ we cause vessels to be fixed at a suitable elevation above the
 “ blast or tuyer holes of the furnaces, from which we convey a
 “ pipe down to the tuyers, and cause it to be fixed either on the
 “ side or through the tuyer pipes, so that the blast may assist to
 “ force the liquid hydro-carbons into the furnace. And to prevent
 “ the blast forcing the liquids back, and prevent or retard them
 “ entering the furnace, we cause the vessels holding such liquids,
 “ at such an elevation as to enable the column contained in the
 “ conducting pipes to force its way in with the blast. But should
 “ it in any situation be found more convenient, we cause the
 “ liquids to be forced in with or by ordinary forcing pumps by
 “ or through the tuyers as with the column above described.”

[Printed, 1s. Drawings.]

A.D. 1859, January 25.—N^o 232.

SPEEDING, BENJAMIN JOSEPH.—(*Provisional protection only.*)

—“ Improvements in apparatus for generating and regulating
 “ gas, and for impregnating the same with volatile hydro-carbon
 “ fluids.”

This invention consists of a peculiarly shaped retort, with a syphon passing through the cover for the purpose of conveying the oil, &c., into the retort. The cover is made to revolve in a trough of molten lead, or the syphon itself revolves, in which case that part of it in the interior of the retort is bent out of the perpendicular so as to bring its lowest end over different parts of the bottom of the retort. The bottom of the retort is made to slope downwards from side to centre, or from centre to side, with a flue passing upwards directly through its centre so as to prevent the deposit of pitchy matter on the inner surface of the retort. The gas, generated in the retort, passes up a perpendicular pipe, and thence into a suitable condenser. It passes thence into a gas-holder which is “ flat at each end, but otherwise in the shape of
 “ a quarter of a circular drum, which I make to revolve or oscillate upon a spindle or shaft into a suitable trough or well filled
 “ with water, from which holder the gas is made to pass into a
 “ drum through a valve which is worked by a disc, the pressure
 “ of the gas upon the said disc closing the said valves partly or
 “ entirely as may be required, by which means the pressure of
 “ the gas is regulated; the foresaid disc is attached to the
 “ aforesaid drum by a flexible diaphragm made of silk, coated on

“ one or both sides with india rubber and sulphur, and when
 “ necessary, a diaphragm of thin gutta percha is added, or water
 “ is made to float round the outside of the said diaphragm to
 “ prevent any smell arising from the same. The gas thus regu-
 “ lated is made to pass into a closed vessel of any convenient
 “ shape, partly filled with naphtha, benzol, or other hydro-carbon
 “ fluid, the said vessel being divided in the interior by a worm or
 “ eccentric partition, which makes the gas to pass in a narrow
 “ channel for a considerable distance over the surface of the said
 “ fluid, by which it becomes impregnated with the vapour of the
 “ same, and its illuminating power thus increased; it is then
 “ allowed to pass directly to the burners.”

[Printed, 4d. No Drawings.]

A.D. 1859, January 29.—N^o 266.

MACKENZIE, JAMES.—“ An improved method of operating
 “ ventilating valves, especially applicable to ventilating gas-
 “ burners.”

In all ventilating gas-burners there is an exit for the products
 of combustion and vitiated air. When the burners are not alight,
 a downward current is liable to enter the apartment in which the
 burner is placed, and produce cold currents.

“ Now, my invention consists in the closing of the exit passage
 “ by means of a valve opened by the pressure of the gas flowing
 “ to the burner, and closed upon the pressure being withdrawn
 “ or cut off.” The valve shown in the drawings turns on a
 “ spindle, to one end of which levers are attached, and to the
 “ other connecting rods slotted to allow the levers to work in
 “ them. These connecting rods work through guides, and have
 “ the upper vessels attached to them. The lower vessels are each
 “ formed of two concentric cylinders, the space between them
 “ being filled with quicksilver. The upper vessels pass down
 “ between the concentric cylinders into the fluid. When gas is
 “ turned on, it flows first into the lower vessels; its pressure
 “ therein raises the upper vessels, and with them the connecting
 “ rods, whereby the valve is opened.”

[Printed, 8d. Drawing.]

A.D. 1859, January 29.—N^o 268.

DAVIES, GEORGE.—(*A communication from J. M. Legris.*)—
 (*Provisional protection only.*)—“ Improvements in apparatus ap-

" plicable to measuring, regulating the pressure of, and consuming gas for illumination."

1. The gas passes from the open mouth of a tube into a hood or inverted box placed over it, and the lower end of which is sealed by dipping into water. From the interior of the hood is suspended a plug working in the mouth of the tube, so that as the pressure of the gas increases, it raises the hood and closes the valve, and as the pressure decreases, closes the valve. The level of the water is preserved by means of a reservoir hermetically sealed, and communicating with the interior of the meter by a tube having an orifice at the level of the water.

2. Regulating piece-valve, key-rod, or diaphragm destined to close or open the aperture for the admission of the gas. In this instance the weight of the hood is made to vary by connecting it to a weighted lever. One modification of this regulator (four are described) is formed by a chamber with collapsible sides in a bellows form; the inlet pipe is provided with a cock, the plug of which is so connected by leverage to the top of the vessel as to close the cock as the top rises, and opens the same as it falls.

3. A short pipe or tube terminates in several smaller diverging orifices. Over these orifices, and with its under surfaces nearly at right angles thereto, is a disc mounted on a screw, and capable of being screwed nearer to or further from these orifices, so as to regulate the intensity of the flame. The form of the flame is determined by the relative form of the end of the pipe where the orifices are, and the under side of the disc. By inverting this burner so that the supply pipe is above, a flame without a shade is obtained.

[Printed, 4d. No Drawings.]

A.D. 1859, February 1.—N^o 293.

HENRY, MICHAEL.—(*A communication from Moissant and Company.*)—(*Provisional protection only.*)—"The manufacture
" and useful applications of certain bituminous products and
" compounds of bitumen with other matters, and treating and
" applying certain natural bitumen or bitumens for such purposes."

A description of bitumen found in the West Indies, and termed chapapote, being subjected to distillation, gives off products applicable (among other purposes) for the hydro-carburetted gases

for lighting. "For collecting the products of volatilization and "condensation, an apparatus may be used very similar to a gas "apparatus, consisting of a furnace with retorts, having tubes "fitted near the head, passing directly to, and sloping off towards "inclined receivers below them, discharging into a column receiving cold water from a perforated vessel at top, to refrigerate "and condense the contents which fall into a receiver below, "separating according to their densities, and are drawn off "accordingly. On the receiver is a tube to carry off the non-"condensable gases, which may be consumed in the furnace or "employed for lighting."

[Printed, 4d. No Drawings.]

A.D. 1859, February 9.—N° 368.

BOWER, GEORGE. — "Improvements in apparatus for the "manufacture of illuminating gas."

The invention is an improvement on Nos. 1161, A.D. 1852 and 649, A.D. 1857, and consists of a cylindrical reservoir having on each side of it an inclined shoot in communication with the main central chamber. The top of the latter carries a set of circular grate bars for the fuel to be used in working the retorts. Over the grate is an upright cylindrical or slightly conical metal furnace lined with fire-clay brick. The fuel is supplied to this furnace by a side door. The retort is a conical vertical cast-iron tube set in the centre of the furnace with its upper and narrower end projecting somewhat above the top cover of the surface. Its lower end is trumpet-mouthed and quite open. It is bolted to an annular supporting flange in the interior of the base reservoir at the level of the water, with which the latter is filled. This open end is filled in with a horizontal disc plate, so as to close the opening just where the trumpet portion joins the lower end of the main cone about the level of the furnace bars. The disc plate is attached to the upper vertical end of a bent or bell crank lever, which extends outwards to the opening in the base reservoir on that side, and passes into and through the laterally-projecting shoot on that side, terminating in a vertical piece jointed to a stud-centre carried upon the top of the projecting chamber. By means of an inclined screw spindle the lever is worked so as to open or close the bottom of the retort as desired. Upon the top of the retort is a coal-discharging chamber, and a gas-discharging appa-

atus for the retort itself. This consists of a short horizontal chamber projecting to one side, and fitted with an Archimedean screw. On the upper side of the chamber is a vertical hopper, with a plug on the top. From this the coal is forced by the periodical turning of the screw into a small vertical chamber, whence it falls directly into the retort. "From the same chamber " a lateral branch pipe passes off to convey the gas and distilled matter away to the hydraulic main, and to my combined gas apparatus, and thence to the gas holder." "Oil, resin, or other material may be used for making gas in this generator by simply dropping the gas-producing matter upon coke, brick, " or other porous or permeable matter in the retort. The gas holder used in conjunction with this apparatus consists of a chamber of vulcanized caoutchouc, fitted with a metal top plate, " and working within a water tank."

[Printed, 1s. 4d. Drawings.]

A.D. 1859, February 14.—N^o 413.

COPCUTT, JAMES.—"Improvements in obtaining light from " gases."

The "oxyhydrogen" light is obtained by directing a jet of ignited gas, at a far greater pressure than "heretofore" employed, on to lime or a prepared material. These gases are contained in two strong vessels, "such as have before been employed for strong " gas for illumination." Into one of these vessels the oxygen, and into the other the hydrogen, is forced by pumps or otherwise. Each of the vessels is connected to the same tube leading to the burner, which is slightly only inclined to the lime or material used. To regulate the supply to the burner, each vessel is furnished with a cock consisting of a screw plug entering a suitable chamber. The under surface of the plug is concave, so that when screwed down upon the bottom of the chamber into which the passage from the gas vessel enters, the flow of gas from the vessel may be stopped. The passage which leads to the burner enters the chamber at right angles a little above the bottom. When the plug is slightly raised, the gas flows from the gas vessel. The lime, &c., is made to rotate, and constantly present fresh surfaces to the jet by motion given to the lower disc or cup in which it rests, an upper disc or cup, pressing on the upper surface of the lime, being so disposed that the plate may rotate

freely with the material, and descend or ascend with it, the axis of the upper disc being mounted on a bar which is arranged to slide freely through guides.

[Printed, 6d. Drawing.]

A.D. 1859, February 16.—N^o 439.

BREEDEN, JOSEPH.—“New or improved machinery for the manufacture of taps or stop-cocks, and fittings for gas, steam, and water-pipes.”

The plugs of the stop-cocks are turned in a lathe, in which the slide-rest is geared to the lathe axis, and the drill and shouldering tool are situated upon the plate carrying the slide-rest. The Specification describes in detail the machinery used respectively for squaring the end of the plug on which the washer fits, and also for drilling the hole in which the stop-peg is inserted; for cutting down that part of the barrel or body of the stop-cock in which the stop-peg works; for making blanks from which screws for the plugs are to be made; for screwing screw blanks and tapping the holes in the plugs of stop-cocks; for slitting or slotting the screws or screw blanks; and for turning the washers.

[Printed, 2s. 4d. Drawings.]

A.D. 1859, February 17.—N^o 441.

COOPER, SAMUEL THOMAS.—“Improvements in the use and application of artificial light.”

The invention is the same as No. 140, A.D. 1859 (*see ante*), in the Provisional Specification of which the inventor “inadvertently” omitted some details of arrangement and adaptation, under the “impression” that they might be reserved for the Final Specification. The principal detail omitted is that the gas is supplied from the main through a branch pipe, and turned on to, or cut off from, the burner, by the action of an ordinary shut-off cock placed at a distance from it. The branch pipe is connected with the main from a gasometer, and fitted at the end next to the main with a shut-off cock, and at the other, close to the burner, with a spring valve, which acts at a lower pressure than that of the gas in the main. Thus, when the shut-off cock is opened, the gas from the main passes through the branch pipe at a pressure which opens the spring valve, and causes the jets to issue from the burner, and when the shut-off cock was closed, the pressure in the

branch pipe is reduced until the spring valve closes, cutting off the supply to the burner, but still keeping the branch pipe full of gas, and excluding atmospheric air. The chief adaptation omitted is that of a railway signal for running trains. A gas-pipe is laid along the line from station to station. The signals are placed two and three miles apart. At each of these points is a lantern, with its fixed flame and signal-burner attached to a branch pipe provided with a spring valve. The gas is supplied to the signal-burner from a small gasometer containing a small supply of gas for about two minutes' consumption. To this gasometer is fitted an apparatus for turning the gas on to the burner, and at the same time filling the gasometer from the main by the action of the train on the handle of a supply valve in passing over the rail. As the train passes each signal lantern, the beacon flame is lighted up, and continues burning two minutes, thus indicating to the running train that another train is two minutes or less in advance of it. Another mode of signalling is by using only one pipe to convey the gas, the gas being reduced or increased in flame by a regulating valve.

[Printed, 8d. Drawing.]

A.D. 1859, February 21.—N^o 473.

HUMPHREY, GEORGE.—(*Provisional protection only.*)—"Improvements in meters for measuring fluids and gases."

The apparatus "consists of a case containing a circular plate
" or wheel revolving on an axis, and from which a number of
" fans or blades project or travel in a race or course formed by
" corresponding projections in the case. The passage of the fluid
" or gas from the inlet to the outlet pipe gives motion to the fans
" or blades of the wheel, and thence to the ordinary registering
" dials."

[Printed, 4d. No Drawings.]

A.D. 1859, February 23.—N^o 491.

ASHTON, WILLIAM.—"Improvements in gas regulators."

1. To establish a state of equilibrium in the regulating valve, so that the movement of that valve, by the pressure of the gas in the branch, may not be impeded by the irregular pressure in the street main. "I prevent the access of the street main to the back
" of the valve by furnishing the latter with a rim or flanch,

“partially immersed in mercury, and forming therewith a mercurial or hydraulic joint or packing, interposed between the back of the valve and the gas of the street main. The valve being thus insulated, I admit air to the back thereof by an aperture passing through the whole length of the valve spindle, or made in the subjacent part of the box or chamber containing the valve; or otherwise I exclude the gas of the street main from the back of the valve by means of the india-rubber packing or joint” (described in 2), “and admit air to the back of the valve as before.” 2. “A properly-shaped sheet of india-rubber is attached in one direction to the rim of the valve, and in the other direction to the chamber containing the apparatus, the breadth of material between the lines of attachment being in redundancy or excess sufficient to allow the requisite liberty of movement in the valve.” 3. A like use of india-rubber in making the joint or packing of the hood disc or movable diaphragm of the receiver, against or upon which the pressure of the gas in the branch is exerted, in order to govern the opening of the regulating valve.

[Printed, *sd.* Drawing.]

[A.D. 1859, February 24.—N° 505.]

WAGNER, JEAN HENRI GUILLAUME DANIEL.—“Apparatus for cleaning water and removing all matters in suspension and dissolution contained in it; water intended to feed generators of all sorts (applicable also to other purposes) which, besides, previous to its getting into the generator, is heated to the highest degree, without almost any expense.”

The principles involved in the construction of the hydratus purifier are—1. The subdivision of the water to be purified into thin continuous films, to be heated while in this continuous state. 2. The double traverse of the film over the two surfaces of the partitions, upon which are deposited all retained any incrustations. 3. The heating of the film by the action of steam. 4. The condensation of the escaping or waste steam during its continuous flow, being increased by means of the partition work in the interior of the apparatus, the flow being always inversely to that of the water, &c., to be heated.

In reference to the 2nd claim in the Specification, for the application of the apparatus (among other things) to “salt and gas

"works," no particulars are given. And in the 9th the apparatus is stated to be applicable to "any purpose whatever; instead of steam, any air or gas, heated or not, may be introduced in order to produce concentrations, crystallizations, evaporations, liquefactions, solidifications, catrefactions, refrigerations, separations, divisions," &c.

[Printed, 2s. 8d. Drawings.]

A.D. 1859, February 28.—N^o 527.

LEIGH, JOHN. — "Improvements in the purification of coal gas."

This invention consists "in the extensive use of gas water, commonly called ammonia water, in the purification of coal or canal gas, the object of such use being the removal of various salts of ammonia from gas. It is well known that coal or canal gas contains before its purification a large quantity of ammonia combined with carbonic acid, hydro-sulphuric acid, prussic acid, &c.; and for the removal of this ammonia from the gas, various substances have been employed, such as sulphate of iron, salts of manganese, sulphurous acid, &c.; but instead of these substances, I wash the gas in suitable vessels with the gas water or ammonia water itself, by which I find nearly all the ammonia salts in the gas to be removed."

[Printed, 8d. Drawing.]

A.D. 1859, March 4.—N^o 577.

MEAD, CHARLES ROPER. — "Improvements in water gas meters."

The principle of this invention consists—1. In maintaining the water in the measuring part of the meter at a constant level, and extending the surface of the water so that the pressure of the gas shall cause the smallest possible displacement of the water in the front of the meter. 2. In shutting off the supply of gas to the meter when the water level in the reservoir is unduly depressed. For the first object a vibrating scoop is used which dips into the reservoir and discharges a small quantity of water at each ascent. The scoop receives its motion from the index spindle by means of a worm wheel and crank, and the motion is so regulated as to make the water supply somewhat in excess of the evaporation in the elevated water chamber, the surface of which

is increased in order to distribute the pressure of the gas under measurement. The float wire that carries the inlet valve is contained down through the upper box in order that it may form a guide for a second float in the reservoir, which float is capable of moving freely thereon. When the water in the reservoir is not sufficient to lift the float, it acts as a weight, and keeps the inlet valve closed. But when the meter is properly charged with water, the lever float rises and liberates the upper float, which, rising by its buoyancy, lifts the valve and allows the gas to enter the meter.

[Printed, *8d.* Drawing.]

A.D. 1859, March 5.—N° 580.

LEIGH, JOHN.—“Improvements in the purification of coal gas.”

This invention consists in the application of causticised or partially causticised gas water or ammonia water, *i.e.* such gas or ammonia water as has been treated with or mixed with lime or any other alkali or alkaline earth with the view of removing the carbonic acid together with any other acids with which such lime, alkali, or alkaline earths may combine in the ammonia water or gas water, to the purification of coal or cannel gas. “This I effect by passing the gas through the gas water which has been so treated, in suitable vessels, in order to remove from the gas not only the salts of ammonia existing therein, but also the carbonic acid, sulphuretted hydrogen, sulpho-cyanic acid, the hydro-cyanic acid, &c., which may also exist in the impure gas.”

[Printed, *6d.* Drawing.]

A.D. 1859, March 8.—N° 606.

DEANE, EDWARD.—(*Provisional protection only.*)—“Improvements in apparatus for the transmission of gas and other fluids.”

This invention consists in “the adaptation of a screw or threaded rod or column or wormed plug (or shot or small globular bodies placed between two perforated discs might answer the same purpose) inserted within the bore of the pipe used for the purpose of transmitting gas or fluids from the gas holder or reservoir to the point of use, by the adoption of which a helical or spiral passage is produced, whereby the course of the fluid is so

“ ordered as to diminish the velocity of its flow, and this may be
“ done to almost any extent by altering the character of the screw,
“ &c., before mentioned. In addition to this a perforated plate
“ may be placed across the pipe, and will thus insure that the per-
“ fect action may be obtained. This apparatus as applied to gas
“ lighting may be placed near the burner to economise its con-
“ sumption, and will prevent the escape of unconsumed gas, and
“ it may be applied to the meter to regulate the passage of gas
“ through it.”

[Printed, 4d. No Drawings.]

A.D. 1859, March 9.—N° 609.

PILBROW, JAMES.—(*Provisional protection only.*)—“ Certain
“ improvements in, or a new method or methods of obtaining and
“ applying, motive power, a modification of which is also applic-
“ able for pumping or forcing liquids, gases, and fluids, as also
“ for measuring liquids, gases, and fluids.”

The Specification describes an atmospheric railway, consisting of an elastic tube, one end of which is open to the air, and at the other end of which is an air pump. Upon the air being exhausted at the one end, two rollers, which are pressed together against the tube, are propelled along in the direction of the exhaustion, and if the tube be of such a thickness as to require 14 lbs. on every square inch of its surface, to collapse at the expansion of the tube behind the rollers, will urge them forward to this amount. “ If such a tube be placed within and around a circular
“ and air-tight chamber, and a wheel having rollers similar to those
“ before described, attached to the periphery placed in position,
“ the one end of the tube being free and open within the chamber,
“ and the other passing out of it, and either open to the atmo-
“ sphere, or connected with a condenser, and steam at sufficient
“ pressure be supplied to the chamber, the steam thus becoming a
“ substitute for the air in the former description, . . . the
“ rollers would in like manner be propelled along the tube round
“ the chamber, carrying with them the wheel, which wheel having
“ an axis passing through the chamber by steam tight stuffing
“ boxes would give a rotary motion to any machinery, and thus
“ form a steam or other engine according to the medium used.
“ This particular form or modification may be varied in several

“ ways, or made to act with water or gas or air under pressure,
“ the principle remaining the same. . . . The same
“ arrangements will also answer as a meter to measure water or
“ gases.”

[Printed, 4d. No Drawings.]

A.D. 1859, March 12.—N° 637.

COURT, JOHN.—“ An improvement in nibs for gas-burners.”

This invention consists “ in forming a chamber in the nib and
“ filling the same with a number of layers of fine wire, wire
“ gauze, perforated plates, or other porous material through
“ which the gas passes. The progress of the gas is retarded and
“ its pressure diminished. It also becomes heated in its course
“ through the nib and more complete combustion, and conse-
“ quently increased illuminating power is the result. I form the
“ chamber either by boring the nib at the bottom of sufficient
“ capacity to receive the layers of wire or other material, and then
“ insert a plug (previously drilled through for the passage of the
“ gas) in the bottom of the nib to press on the material so placed,
“ to confine it in its position; or I bore the nib at the top, and
“ after placing the wire gauze or other material, I confine it in its
“ position by an iron, earthen, or glass tip being fixed in the top
“ of the nib; the tip is drilled or slit as in the ordinary union
“ jet or bats-wing nibs.”

[Printed, 6d. Drawing.]

A.D. 1859, March 14.—N° 647.

PATSTONE, THOMAS.—“ Improvements in shades or glasses for
“ gas and other lamps, and in the supports of the said shades or
“ glasses.”

This invention consists—1. In covering the upper part of the
shade or glass with a dome or other shaped cover, carried by, and
supported by, a perforated lining or support, the latter resting
either on the edge of the shade or glass, or being supported upon
the top of a rod from the gas pipe or lamp stand. 2. In making
the said supports or holders of glass by which the shadow of the
ordinary holder is avoided, and an ornamental appearance given
to the shade or glass.

[Printed, 8d. Drawing.]

A.D. 1859, March 23.—N^o 742.

NEAL, GEORGE.—“Certain improvements in apparatus or fittings connected with the burning of gas for regulating and economising its consumption.”

The patent regulator may be applied at any part of the gas fittings. “In constructing this description of regulator, the chamber or cavity containing my principle of regulation, forming the base of the part that extends up surrounding the base of the jet or other formed burner. This cavity I fill with sponge or other like porous homogeneous matters in a bulk, or in separate layers, according to the nature of the porous material used, so arranged that by means of a perforated plate or disc of gauze wire, suitably strengthened, I am enabled to compress such porous matter so as to regulate or allow the gas to permeate through it at such a rate that when lit it shall be enabled to commingle with and consume a due proportion of atmospheric air,” thus producing silent, perfect, and brilliant combustion without injury to health or works of art.

[Printed, *sd.* Drawing.]

A.D. 1859, March 29.—N^o 781.

KELLY, JOHN WILLIAM.—“Improvements in gas-burners.”

This invention consists—1. In the application of a small cylindrical tube or ring of brass or other metal to the outside or top of the fish-tail, bat-wing, or other form of gas jet or burner, by means of which a more complete combustion of the gas and increase of illuminating power is obtained. 2. The “meter burner.” In this a number of apertures are made immediately above or on the burner side of the cock, “which apertures are to be of various sizes, corresponding or nearly so with the sizes of the fish-tail or bat-wing burners from number 0 to 4 (or larger if deemed desirable) at present in use, and to cover or enclose these apertures in a small bell-shaped or other form of chamber, at the top of which is to be inserted a fish-tail, bat-wing, Argand, or other burner of larger apertures or consuming capacity than any of those enclosed beneath. By this means and the aid of an external index or dial, the key of the cock may be turned so as to lead the gas through any of the apertures mentioned, and thus let pass to the burner a quantity of gas corresponding

" exactly to that which would be issued by any of the burners
" now in use."

[Printed, 6d. Drawing.]

A.D. 1859, March 29.—N^o 782.

DE CARANZA, ERNEST.—(*Provisional protection only.*)—"A
" new system of gas lighting through new apparatuses and mat-
" ters richer in gas than pit coal."

" I propose to obtain gas from the following matters, viz., bog-
" head or ompelite clay, of greasy sawdust, obtained from wood
" that has been used in refining or cleansing fatty matters, of pit
" coal, and of the fatty residues left in the extraction of schistic
" oils, usually in the following proportions:—Boghead, 50 parts;
" sawdust, 30; fatty residues, 15; and pit coal, 5." The matter
is placed in perforated cylinders, introduced into retorts placed
in " a furnace lined with refractory brickwork, and provided
" with a tap to permit the escape of the emanations arising from
" the charging and discharging of the retorts, and gas passing
" from the retort through a pipe leading to an apparatus serving
" at the same time as refrigerator and purifier, and after passing
" through the layers of lime, enters the gas holder. This system
" is intended principally for use in private establishments."

[Printed, 4d. No Drawings.]

A.D. 1859, April 2.—N^o 823.

DESMET-SÉAUT, JOSEPH.—(*Provisional protection only.*)—"An
" improved gas burning and lighting apparatus."

The apparatus consists of an enclosed cup or vessel of glass or
other suitable material, within which a recipient is fixed contain-
ing water for purifying the gas on its passage from the main
through suitable openings in a supply pipe to a rotating pipe
which is partly immersed in water. The latter pipe turns on a
pivot, and is caused to rotate by the pressure of the gas on its
passage through it, and communicates the rotatory motion to the
branches or burners in communication with it, and which may be
arranged in a spiral or other form.

[Printed, 4d. No Drawings.]

A.D. 1859, April 2.—N^o 828.

SKERTCHLY, JOSEPH.—(*Provisional protection only.*)—"Im-
" provements in apparatus for regulating the pressure of gas."

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1. Oscillating valves working in mercury, and so arranged as to release on one side of their centres a quantity of mercury equal to that displaced on the other. One side of the valve presents a larger surface to the action of the gas than the other, and by loading to the required pressure the side least exposed, the valve remains stationary, until the gas exerts a pressure superior to this load upon the more largely exposed side, which causes the latter to descend into the mercury, and the loaded side to rise out of it. By this action the admission of gas from the supply pipe may be regulated. 2. Vertical action valve constructed of a small inverted cup with slits or openings at its edges. This cup is surrounded with a solid or hollow ring of larger area than the cross section of the cup, and connected with it, a small space, however intervening. The cup and ring float on mercury, and being loaded to the desired weight operate as follows:—“Gas being admitted through a pipe into the cup above the surface of the mercury, escapes through the slits or openings, and rises between the cup and ring, and when the pressure of the gas exceeds the initial pressure of the valve, it acts on the large surface of the ring, pressing it down and carrying the cup along with it into the mercury; and as the slits or openings gradually descend beneath the mercurial surface, the supply of gas is proportionably lessened. 3. Either separately or in connection with either of the preceding arrangements, I reduce the pressure of gas by causing it to percolate through any suitable depth or thickness of granulated material. By this means the column of gas is broken up and more equally diffused in its passage to the burner.”

[Printed, 4d. No Drawings.]

A.D. 1859, April 8.—N° 878.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from Victor Doré.*)—“An improved articulated joint for water, gas, and steam pipes.”

One portion of the pipe shown, ends in a spherical chamber corresponding with a spherical protuberance on the end of the second portion of the pipe. The whole is secured by a pledget of lead, caoutchouc, or other suitable matter which, while effectually maintaining the spherical extremity of the second portion of the pipe in connection with the first pipe, admits “of either being

" inclined to a certain extent without interfering with their working power. It is evident that by combining a number of these articulations, any required curve or inclination may be given to the pipes laid down, thus avoiding the formation of fixed joints with acute angles as now generally practised."

[Printed, 8d. Drawing.]

A.D. 1859, April 12.—N° 911.

DOIG, DAVID.—(*A communication from William Gilbert Ginty.*)—"Improvements in the construction of gas-lamps."

This invention consists—1. In the use of glass prisms, or triangular pieces of glass, placed horizontally or nearly so, on the upper part of street or other gas-lamps, so as to refract, reflect, bend, or otherwise divert horizontally or downwards the rays of light "hitherto lost or nearly lost upwards in space," or "lost or nearly lost by the use of tin or copper lamp tops." 2. In the substitution of glass, or glass combined with metal, for the ordinary tin or other opaque framing of street gas-lamps, thus preventing the shadow ordinarily thrown below, and preserving the rays hitherto lost for the purposes of practical and useful illumination.

[Printed, 10d. Drawing.]

A.D. 1859, April 23.—N° 1021.

MUTAL, PIERRE FRANÇOIS, and BLANCHARD, LUCIEN HENRI.—(*Provisional protection only.*)—"Improvements in gas-burners."

This invention relates to Argand burners. "The gas issues through the perforations of a circular plate with which the top of these burners is provided. Instead of these holes we introduce and fix in this plate, at the required distances apart, small tubes of iron or any other other suitable metal or material and of the required diameter and length according to the size of the burner, through which tubes the gas issues from the burner."

[Printed, 4d. No Drawings.]

A.D. 1859, April 27.—N° 1052.

CIROUX JEAN MARIE.—(*Provisional protection only.*)—"Improvements in lamp glasses and shades applicable to gas-burners, light-houses, and railway-signals."

This invention consists "in making glasses and shades of crystal, rendered convex either externally or internally or on both sides for lamps and lanterns, and applicable to certain gas burners, to light-houses, and railway-signals, which convexity is obtained by known means, and by which a greater brightness is given to the light than by ordinary glasses."

[Printed, 4*d*. No Drawings.]

A.D. 1859 April 27.—N^o 1058.

LAING, ROBERT JAMES.—"Improvements in wet gas meters."

"Wet gas meters, as at present constructed, are very liable to be tilted in such manner as to interfere with due registration of the quantity of gas passed through them, and my improvements relate to means by which when such tilting takes place, this passage of gas through the meter will be suspended, and then restored so soon as the position of the meter is again correctly adjusted. For this purpose I apply a ball or other suitable valve, suspended by an arm or other suitable means from above on either or both of the gas passages of the meter, in such manner that when the meter is in correct position, such valves will hang free of the openings they are capable of closing but so soon as any tilting takes place, these openings will be closed and the passage of gas stopped. If desired these valves may be arranged in pairs so as to close either way."

[Printed, 1*s*. Drawings.]

A.D. 1859, April 27.—N^o 1061.

LACEY, THOMAS.—"Improvements in gas regulators."

This invention consists "in suspending and supporting a conical valve by means of a diaphragm of thin sheet caoutchouc or caoutchouc fibre in a tube or ring; in covering the top of the tube with a cover; in carrying a spindle from the upper part of the conical valve through a central aperture in the cover; in fitting a valve on the spindle, having its seat on the top of the cover; and in forming a communication with the atmosphere from the chamber in which the upper valve rests, and through the aperture in the cover to the top of the diaphragm and valve. For large regulators I form the diaphragm of leather, and protect it by means of thin metal plates or shields, and use counter-weights to balance the weight of the diaphragm. The conical

“ valve is weighted according to the pressure of gas to be allowed to pass through the regulator. For such regulators as are used in gas-works, I employ a regulating bar on the top of the valve spindle, and cause weighted rollers, carried by rods hinged to the top of the regulator case, to travel along and rise and fall with the valve, or I join rods on weighted levers to the top of the valve spindle, and fix rollers upon supports rising from the case over which the rods travel.”

[Printed, *8d.* Drawing.]

A.D. 1859, April 30.—N^o 1091.

SOUQUIÈRE, JOSEPH,—“A new or improved process for distilling coal.”

To obviate the defects in coke, which “hitherto” has been light, spongy, and friable, in fact, unfit to be employed in apparatus requiring a very high temperature,” coke produced by any of the known processes is pulverized and mixed with various proportions of pounded coal. The mixture is then heated and new coke thus obtained, “composed of one part coke twice distilled, and another part coke which has been once distilled; the coke twice distilled being always of greater density than that only once treated. Further, this improved coke does not produce a spongy appearance: it is sonorous, and firm, and suitable for all purposes. . . . Gas is more abundantly produced from the distillation of this improved mixture, and possesses a lighting power superior to that produced from raw coal. The operation moreover, is effected more rapidly, and as the contents of the retort diminish in volume, the coke produced may be withdrawn in a single lump. In conclusion, by the employment of this improved process in gas-works, coke may be obtained of great density suitable for all purposes, and producing gas in a greater abundance and volume. Further, it is suitable to remark that in ordinary gas-works where the retorts are heated by means of coke, . . . this combustibile, which is so much improved by my improved process, may be replaced by any fuel of less value, such as raw coal, peat, or other substance. Finally, the use of my improved process tends to produce great economy in the management of gas-works.”

[Printed, *4d.* No Drawings.]

A.D. 1859, May 5.—N° 1130.

KNOX, ANDREW.—(*Provisional protection only.*)—"Improve-
ments in gas regulators."

The invention relates to such regulators as have a weighted flexible diaphragm, upon which the gas admitted to a small chamber, termed a low-pressure chamber, acts, and by such action increases or lessens the passage of gas to the burners. It consists
1. In the arrangement of two or more valves in combination for the admission of gas to the diaphragm chamber, such that their weight and the pressure of the gas on them counterbalance each other, by reason of which the regulator will work with great uniformity, even at the lowest pressure. To effect this, I connect the two valves by a light lever mounted on a suitable fulcrum.
2. The valves are faced with leather or other suitable substance "so
" that a close contact is more readily obtained than by the use of
" metal surfaces; by being so closed the accumulation of gas
" in the pipes is prevented. 3. The central spindle, supported
" by the diaphragm of the low pressure chamber, is made hollow
" so that the gas in that chamber enters the hollow spindle and
" ascends direct to a burner on such spindle immediately above
" or it may be directly utilized."

[Printed, *4d.* No Drawings.]

A.D. 1859, May 6.—N° 1140.

WRIGHT, SAMUEL.—"An improved gas governor or regulator."

"I govern or regulate the pressure of gas by passing or diffusing
" it through a woven texture of linen, cotton, silk, hair, or it may
" be a metal fabric, into a chamber or chambers to which the
" burner is attached . . . This woven fabric of fibrous or other
" material I stretch in a small chamber, to which the gas is ad-
" mitted in its passage to the burner in the form of a diaphragm,
" through which the gas must pass before escaping at the burner.
" Instead of one diaphragm of woven fabric, two or more like
" diaphragms may be interposed if required."

[Printed, *6d.* Drawing.]

A.D. 1859, May 10.—N° 1170.

DEFRIES, MOSS.—"Improved apparatus for regulating the
" pressure of gas."

To regulate the pressure, and in part to purify the gas in its

passage from the ordinary gas-pipe to the nipple of the burner, two or more metal or earthenware filtering plates are placed in a chamber constructed under the nipple or burner. The space between the plates is filled with shot, beads, grain, or "any suitable substances of 'sphered form.' The gas, in its passage from the chamber, permeates through the plates and shot, causing the latter, where the pressure of gas is strong, to move about and thus cleanse the gas from impurities, leaving it to pass into and from the nipple or burner with a uniform pressure." The improvements "can be applied to Argand fish-tail, or any description of gas burners."

[Printed, 8d. Drawing.]

A.D. 1859, May 10.—N° 1177.

ABSTERDAM, JOHN.—(*Provisional protection only.*)—"Improvements in impregnating illuminating gas with hydro-carbon vapour."

This invention consists—1. In the use of vapours obtained from hydro-carbon liquids of a high boiling point, such as coal oil, or spirits of turpentine, so as "to obviate the difficulty arising from gas impregnated as usual with vapours formed from very volatile hydro-carbon liquid, such as naphtha, which condenses with the slightest change in temperature, so that not only the benefit expected from the same is lost, but the deposit formed by condensing vapour in the pipes is an impediment to the passage of the gas." 2. Apparatus in which the gas is impregnated, consisting of a series of chambers divided into a number of passages lined with cloth or other similar material or porous fabric, and which, when they are partly filled with the desired liquid raise the same by absorption or capillary attraction so that it forms into vapour, which, when the gas is passed through these passages, is absorbed, and that on account of the large quantity of vapour thus absorbed, the illuminating power of the gas is sufficiently enhanced, notwithstanding the substances of these vapours which are formed at a temperature considerably below the boiling point of the liquid from which they emanate.

[Printed, 4d. No Drawings.]

A.D. 1859, May 16.—N° 1215.

ADAMS, EDWARD.—(*Provisional protection only.*)—"The employment of machinery for drawing or extracting the gas flame

“ or smoke from furnaces, and forcing the same into them or into the cupola, to be used as blast or fuel for melting iron or mines of any description.”

“ My invention consists in the employment of machinery for drawing or extracting the gas flame or smoke from furnaces, or forcing the same into them or into the cupola, to be used as blast or fuel for melting iron or mines of any description, by which I effect a considerable saving in the consumption of fuel from the means heretofore in use.”

[Printed, 4d. No Drawings.]

A.D. 1859, May 17.—N^o 1224.

LANDRE, ALEXANDRE RÉNÉ, GRAS, POLYDORE, and BOUCHERIE, ANTOINE LOUIS AUGUSTE.—“ Distilling schist or boghead coal and other minerals for lighting.”

“ The disadvantages of the apparatus hitherto used for the purposes of our invention are, firstly, that the retorts being that of an ovoid form, and fully charged with mineral, a very intense fire becomes necessary in order to submit the column of mineral in the centre of the retort to the action of the caloric, the evils of which are that the retort wears more quickly (the homogeneity of the metal of which it is constructed being impaired by the intense heat), and that gases are disengaged from that portion of the mineral which rests against the interior of the retort; secondly, that the fire being now applied at about the middle or two-thirds of the height of the retorts, and the natural tendency of the caloric being to rise, the fire exercises its strongest action upon the upper part of the charge, which is therefore in distillation before the lower layers, and when these latter feel the effect of the fire, the bituminous vapours which they involve must traverse a burning centre, where they are turned into gas, proportionally diminishing the liquid which it is desired to obtain.” By this invention the vertical sides of the retorts are formed of partially cylindrical columns alternately projecting and re-entering. The fire is applied at the base of the retort, and the centre of the retort is a vertical tube extending from its upper to its lower orifice. This tube is pierced throughout its entire length with holes, through which the bituminous vapours escape to the refrigerator.

[Printed, 8d. Drawing.]

A.D. 1859, May 20.—N^o 1244.

PARFITT, GEORGE JOHN.—“Improvements in gas-burners.”

This invention consists—1. In drilling holes in the Argand or other burners from the inside of the inner tube or gas chamber of the burner in such directions as to allow the gas to meet, so as to produce a flat light known as the fish-tail. 2. Of a perforated cone or tube of any shape placed in the centre of the burner; the gas when passing surrounds the cone or tube in a chamber of its own, a perforated or porous plate or plates forming the bottom of the glass holder, gallery, or triangle of the burner, and thus regulates the supply of oxygen from the air. 3. Of a tap or cock, the plug of which has holes drilled through its centre so as to admit only such a quantity of gas as can be consumed to give the greatest amount of illuminating power. 4. Perforated plates placed inside the plug or other portion of the tap or cock, packed with horse hair, so as to allow the aforesaid quantity of gas to pass through the tap without noise at any pressure. 5. Perforated or porous plates or wire gauze regulating the quantity of oxygen from the air to the side of or round the light, to render combustion perfect. 6. Reflectors of glass or metal electroplated or silvered.

[Printed, &c. Drawing.]

A.D. 1859, May 20.—N^o 1248.TEASDEL, WILLIAM.—(*Provisional protection only.*)—“Improvements in coffer dams.”

The “Nautilus coffer dam” described in this Specification, is, among other things, particularly adapted for laying gas-pipes. The dam is planked vertically or horizontally “waling,” and is caulked with a single tier of sheet piles driven a short distance into the ground, with at intervals a wedging or closing pile. Where the bed is of stiff mud, clay, or peat the sheet piling may be dispensed with, the settling down of the ram being effected by the aid of hollow air-tight wings at the sides thereof, into which wings water may be allowed to enter, or by bags of ballast. To prevent the pressure of water under the bottom of the dam, stout canvass aprons are secured to the lower part thereof, and fastened on the outside of the dam to a chain, and drawn out so as to lie on the bed, and held down by ballast. The piles are confined between double wales at back and front, the back wales being part

of the structure, whilst the inner ones are free to be raised or lowered, secured by uprights and fastened by screw eye-bolts.

[Printed, 4d. No Drawings.]

A.D. 1859, May 25.—N^o 1287.

HARMER, JAMES.—(*Partly a communication from William Sinderby.*)—"Improvements in parts of dry gas meters."

The invention relates "to the crank and parts in connection therewith for giving motion to the valves to facilitate adjustment thereof and of the valves. For this purpose the crank-pin, which by links or arms gives motion to the valves, is formed of an increased diameter in relation to the crank axis or parts thereof, so that the eyes or holes in the ends of the links, connected thereto, may freely slide over such axis or part thereof and on to, so as to fit without shake such enlarged crank-pin without the necessity of slitting or otherwise opening such part of the connecting links or arms, as is the general practice, for the purpose of getting these connecting links or arms on the crank-pin, as well as giving facility for the use of connecting links of stiffer and thicker metal, and the application of washers between them. And these links are retained in position if required by a collar or washer and pin, or such like means."

[Printed, 10d. Drawing.]

A.D. 1859, May 26.—N^o 1308.

BENT, JAMES CORN.—"Improvements in gas-meters."

1. To keep the water constantly at a proper level in wet gas-meters, a water lifting lever, worked by a cranked wheel, in gear with the ordinary index shaft wheel, at each revolution of such wheel is made to dip a cup at each end of the lever into a supply tank, take up a small quantity of water, and deposit it in the measuring chamber. 2. Application of two floats to the ordinary valve, whereby one valve is made to answer the purpose of two. This is effected by placing one float on the portion of the meter in connection with the measuring chamber, the other in one of the supply tanks, and connecting them in such a manner that should the water get too low either on the supply tank or in the measuring chamber, the floats fall, close the valve, and stop the gas. 3. Employment in some cases of two supply tanks instead of one, *i.e.*, the front box of the ordinary meter may be divided into

" three compartments, the centre one forming a chamber for the
" reception of waste water, and the other two to act as the supply
" tanks."

[Printed, 10d. Drawing.]

A.D. 1859, May 27.—N° 1314.

FARRENC, LEON, and SUBRA, BERNARD.—" Improvements in
" gas lighting by means of direct carburators."

This invention consists in certain apparatus for causing the gas to come in contact with any suitable carburating liquid, such as naphtha or others, and thereby increasing its lighting power. " Hitherto these carburators or apparatus were situated in such a manner that the gas for several burners at considerable distances from each other was obliged to pass through the same carburator, and afterwards had to travel through a great length of tubing before arriving at the burners, the effect of which was that often a condensation of the carburating liquid took place in the pipes, and more or less choked them up. Our invention consists in providing each burner with its own carburator, situated close to it or at such a small distance from it as to make the pipes no more liable to become choked up by the condensation; or several burners fitted on the same gas channelier may be provided with one carburator common to all of them."

[Printed, 10d. Drawings.]

A.D. 1859, June 8.—N° 1400.

NEWTON, ALFRED VINCENT.—(*A communication from William Richards.*)—" Improvements in gas-meters."

1. To prevent the passage of unregistered gas through the meter when the latter is designedly set on an inclination, the ordinary "spout" is set in front of the float of the meter, or, without changing its place, the spout may be bent over, and its inverted mouth brought into an advanced position in the meter case. Thus, when the meter is tilted, the gas is cut off from it, to render inappreciably the change of level in the water line caused by evaporation or otherwise. The drum is formed "so that the measuring chambers, instead of extending from the periphery of the drum to the axle, or near it as heretofore, shall terminate so far short of the axle as to form a chamber in the centre of

" the drum, into which chamber curved plates or lips project for the purpose of sealing long narrow passages, through which the water enters the measuring chambers in succession, in order to expel the gas therefrom." To ensure as little deviation as possible in wet meters not provided with the patent wheel, a ball-cock is mounted in a reservoir divided into two compartments, and attached to the outer case of the meter. A pipe commanded by the cock, which is worked by a ball float, leads from the upper chamber to the lower. When the water level becomes depressed in the meter, the ball falls and opens the cock, thereby admitting water from the upper chamber to the lower.

[Printed, 1s. Drawings.]

A.D. 1859, June 10.—N° 1406.

GREENSHIELDS, THOMAS.—"Improvements in purifying gas and obtaining ammoniacal and other salts."

One part of the invention has for its object an improved mode of separating from the gas the ammonia, sulphur, and carbonic acid, whether combined with other elements or not. This is effected by passing the gas through "scrubbers," or evaporating pans, supplied with a solution of chloride of barium, which decomposes the impurities and combines with the ammonia, sulphur, &c.

[Printed, 4d. No Drawings.]

A.D. 1859, June 10.—N° 1409.

HAAS, ALBERT FREDERICK.—(*Provisional protection only.*)—

"Improvements in lamp and glass shades or glasses."

This invention consists—1st. In making these of beads, transparent, opaque or coloured, or of shells, and according to any suitable device, pattern, or ornament. 2nd. In "making them of glass having two or more different colours, or it may be of different degrees of transparency in its thickness, the one colour or shade being cut through and removed to form suitable ornamental device or pattern." 3rd. "Applying different coloured glass pieces or ornaments, or of different degrees of transparency, or a plain or coloured shade or glass in its manufacture, thereby, showing different coloured glass or ornamentation by its trans-

"porency or otherwise; such ornamentation may be cemented on the glass or shade forming the groundwork."

[Printed, 4d. No Drawings.]

A.D. 1859, June 16.—N^o 1443.

LUIS, JOZE.—(*A communication from Edward Ferguson.*)—"An apparatus for regulating individually the pressure, expenditure, and light in gas-burners."

This invention consists of an obstructor "placed in the key of the cock of each gas-burner. Two forms of the invention are shewn in drawings, in one of which the obstructor is in the form of a screw," "rounded at one end and grooved at the other, so as to be worked by a turn-screw, and in the other of a little key held in position by a screw." "A manometer" is shown, regulating the pressure at each burner.

[Printed, 8d. Drawings.]

A.D. 1859, June 20.—N^o 1480.

LAMING, RICHARD.—"Improvements in purifying gas, and in obtaining and reproducing materials useful for that purpose."

This invention consists—1st. In the combined use of three or more consecutive scrubbers for the partial purification of gas, so fitted and worked as to scrub it finally with a small and inter-mitting supply of fresh water; after the same portion of gas has been consecutively scrubbed in each of two scrubbers with water that has been gradually becoming by such use, converted into ammoniacal washings, such washings being supplied incessantly and in profusion. 2nd. In the purification of gas from sulphuretted hydrogen, either wholly or in part, by any oxide of manganese made by exposure to atmospheric oxygen, any hydrated precipitate containing that metal to a state of oxydation higher than protoxide, when such oxide is continually reproduced by the spontaneous revivification of the spent material. 3rd. Processes for making a higher revivifiable oxide of manganese subsequently to the precipitation of the metallic preparation. 4th. Purification of gas from sulphuretted hydrogen by mixtures compounded of caustic lime or of chalk with native peroxides or sesquioxides of iron or manganese. 5th. Purification of gas by a porous mixture of an artificial and higher oxide of manganese with hydro-chlorate of the same base or of lime.

[Printed, 6d. No Drawings.]

A.D. 1859, June 23.—N° 1510.

DESSALES, ALEXIS JEAN.—“An improvement in the working
“and securing of sliding tubes applicable to gas chandeliers,
“lamps, and other purposes.”

This invention consists in having the internal tube grooved at equal distances, and by placing on each side of the outer tube a steel spring terminating in a clasp which enters the groove, and serves to hold the internal tube firmly in its place. By turning the internal tube to the right, a movable key or plate, placed at the extremity of the outer tube, and between the two steel springs, is brought into play, causing the clasps which fix in the grooves of the internal tube to loose their hold, and allow the internal tube to descend. By turning the internal tube or chandelier attached to it to the left, the pressure of the key or plate upon the springs is removed, and the clasps are allowed to resume their hold in the groove of the internal tube, and secure it firmly.

[Printed, 10d. Drawing]

A.D. 1859, June 29.—N° 1547.

WILKINSON, WILLIAM, and WHITE, DAVID.—(*Provisional protection only*).—“Improvements in apparatus for holding, regulating, compressing, and burning gas and other gaseous fluids, parts of which apply to the holding of liquids.”

These consist of a series of cylinders, lined with enamel, and sliding one within the other. The gas is prevented by means of regulating screws from forcing up the cylinders by filling them until the gas has attained a given pressure. “Other improvements in regulators for gas consist in constructing them of china or earthenware, combined or not with metal, and in filling the interior through which the gas is to pass with springs, filaments, horsehair, or other springy substance, elastic or non-elastic fabric, and mineral or vegetable powders.” The regulators have valves or slides which admit a given quantity of gas to issue in a given time. They are also constructed for more than one burner of two or more chambers, with inlet and outlet pipes, and with a valve in one or more parts, and in which the pressure of gas is made to work against a disc, which works the valve and contracts the outlet when the pressure becomes too great. The disc is supported by mercury or other suitable agent. In apparatus for burning gas the access of air to the bottom of the

burner is cut off, and suitable apertures made in the upper part of the lamp for the inflow of air to support combustion, and the exit of unconsumed products of combustion. Talc is laid on the top of the chimney to concentrate the heat and induce a draught. Silvered reflectors are used under and above the burners. A syphon with tight screw nut is fitted in the bottom of lamps, globes, &c., for the withdrawal of any water that may accumulate. The holder of the globes, which are formed within a rim, is constructed with a spiral spring.

[Printed, 4d. No Drawings.]

A.D. 1859, June 29.—N° 1549.

WILLIAMSON, WILLIAM JOHN THOMPSON. — "Improvements in gas-burners."

"There is screwed on to the end of the pipe supplying the gas a small metal chamber, into the bottom of which there is fitted a small tube closed at the top, and furnished with a head of a conical or other suitable form, larger in diameter than the tube which carries it; just underneath this head holes are formed through the sides of the tube, and it is by these holes that the gas passes from the supply pipe to the interior of the chamber. In the top of the chamber a burner of an ordinary construction is fitted, and the perforations of the burner are made considerably larger in area than the holes through the sides of the small pipe by which the gas enters the chamber. By this arrangement the gas in passing from the supply pipe to the burner is caused to take a very circuitous course, passing first along the under side of the head formed on the small tube, and then between the upper side of the head and the side of the chamber which contains it; and, in consequence of the gas after it passes the ordinary regulating cock having to pass through holes of smaller area than the perforations in the burner, it escapes from the burner at a comparatively low pressure, and from this an economy results."

[Printed, 6d. Drawing.]

A.D. 1859, June 29.—N° 1551.

GRIFFIN, JOHN JOSEPH. — "Improvements in gas furnaces, suitable for fusing refractory metals."

The gas-burner employed consists of a cylindrical metal case closed at the bottom, and having at the top a cover composed of a block of cast iron. The case is divided into two compartments by a partition. Coal gas is admitted to the upper compartment, and escapes by holes in the cover. Air is forced into the lower compartment, and passes from it by tubes fitted into the partition. These tubes are equal in number to the holes bored in the cover of the case, and pass up through these holes to the level of the upper surface of the cover, leaving spaces around each of them for the escape of the gas. "Thus from each hole in the cover a cylindrical jet of gas passes, having an air jet in its interior, and when these jets are inflamed great heat is produced." A burner thus made is fitted closely into a hole in a slab of refractory pottery ware. On the slab and over the burner is placed a cover, in the top of which is a hole for receiving a crucible, and over the crucible is another perforated cover. The space between the outer cover and the furnace wall is filled with small flints to keep in the heat. The exterior wall of the furnace is formed of one or more rings of refractory pottery ware, or other suitable material, so arranged that it, together with the covers and flint packing, can be raised when required so as to expose the crucible.

[Printed, 8d. Drawing.]

A.D. 1859, July 1.—N^o 1576.

KENWORTHY, WILLIAM EDWARD.—(*Provisional protection only.*)—"Improvements in purifying gas, and saving of lime in the said purifying."

"My improvements in purifying gas consist in the use of flue, dust, or fine ashes, mixed with sulphuric acid, and used in the manner of hydrate of lime. I place this at the bottom layer, or on the bottom shelf of the purifier, and make use of the hydrate of lime as otherwise usual. The purifier and the method of using it for purifying gas may be the same as in ordinary, with the exception of the addition of the matters above mentioned, whereby a great saving in the hydrate of lime is effected."

[Printed, 4d. No Drawings.]

A.D. 1859, July 5.—N^o 1594.

KNAPTON, WILLIAM, and AITCHISON, ADAM.—"Improvements in the manufacture of gas."

This invention "consists in manufacturing gas from materials comparatively valueless with more speed than heretofore, and at a nominal cost, a small apparatus only being required to manufacture large quantities." Bark knots, the refuse bark of the pits, bark of trees, chips of wood, sawdust, and timber waste thoroughly dried are placed in suitable retorts, and "treated in a similar manner to the coal in the manufacture of coal gas, but producing a pure hydrogen gas with nearly the same illuminating power as coal, without the unpleasant smell arising from coal, there being no dirt, &c. . . . In order to give the gas so produced the greatest amount of illuminating power we pass it over or through spirits of naphtha, camphine, or other suitable spirit."

[Printed, 4d. No Drawings.]

A.D. 1859, July 6.—N^o 1603.

HORTON, JOSHUA.—(*Provisional protection only.*)—"A new or improved gas-meter."

This invention consists of a vessel, the open mouth of which is turned downwards and immersed in quicksilver, oil, water, or other liquid; it turns on an axis connected with one of its sides, and is enclosed in a close chamber. A valve external to the chamber is connected with the axis upon which the vessel turns, and acts thus:—When the moveable vessel has risen by the delivery of gas under it, the valve shuts off the gas from the supply pipe and permits it to pass to the delivery pipe. The vessel sinks as the gas passes out, and the gas is at the same time admitted to the closed chamber, which fills as the vessel empties itself. As soon as the vessel has sunk to its full extent, and the closed chamber in which it works has been filled with gas, the valve shuts off the supply to the closed chamber and opens the communication between the chamber and the delivery pipe, at the same time the supply is directed to the moveable vessel, which is shut off from the delivery pipe. The working of the valves is effected by the motion of the moveable vessel, by which also the number of ascents of the vessel and quantity of gas passing is registered.

[Printed, 4d. No Drawings.]

A.D. 1859, July 8.—N^o 1620.

DAWES, WILLIAM HENRY.—"An improvement or improvements in the manufacture of iron."

This invention consists in introducing compressed or condensed hydrogen into the blast furnace during the smelting of the ore, either with the ordinary blast or by means of separate tuyeres or jets; by this, owing to the peculiar point at which it is introduced, acting on the materials in the furnace before the iron is reduced, and upon the particles of reduced iron before they reach the hearth, effects, by combination with them, the removal of the sulphur and phosphorous contained in the materials. The hydrogen is made by passing high-pressure or superheated steam over coke or charcoal in a close vessel. The mixed hydrogen and carbonic oxide thereby produced is stored in a gas holder. Between the retorts and the gas holder is a condenser similar to that used for coal gas, by which the gas is cooled and any undecomposed steam condensed.

[Printed, 4d. No Drawings.]

A.D. 1859, July 9.—N° 1641.

LIVERMORE, ELIJAH.—(*Provisional protection only.*)—"Improvements in generating gas for the purpose of lighting and heating."

"The object of this invention is to give to gaseous or carbonaceous fluids the properties of heating and illuminating, which I propose effecting in the following manner:—I employ a suitably constructed apparatus for the purpose of forcing air into and among the Neubian oils patented by me on the 8th day of July 1859, N° 1626, and all other gaseous or carbonaceous fluids whatsoever, for the purpose before mentioned."

[Printed, 4d. No Drawings.]

A.D. 1859, July 26.—N° 1734.

BUCKLAND, WILLIAM HENRY.—"An improved preparation of peat."

The peat being placed in a vessel and stirred, the fibrous or partially decomposed portions become separated from the brown or black slimy part, which is wholly decomposed. The latter is separated by straining through a sieve, and flows into a suitable vessel, where the fine particles of peat are deposited, and the water is run off. The deposit is then moulded and dried. "When thoroughly dry the material will be so hard as to admit of being turned in a lathe, and when used as fuel . . . will burn with

" the freedom and brilliancy of the best coal. It may also be
 " converted into charcoal or used for generating gas."

[Printed, 4d. No Drawings.]

A.D. 1859, August 3.—N^o 1795.

BLEWS, WILLIAM HENRY MAXWELL.—(*Provisional protection only.*)—" A new or improved regulator for gas-burners."

This regulator is placed between the supply pipe and the burner. It is constructed as follows:—The gas is supplied to a small chamber made in halves and screwed together. The gas is delivered near the top of the chamber by a pipe passing up the axis of the chamber. The gas escapes from the pipe through jets made in a horizontal plane. Over the said pipe a bell-shaped cap is dropped, against the interior of which the horizontal jets of gas strike. The gas descends in the inside of the said cap, and passing its lower edge, rises between the said cap and the chamber to the top of the chamber, whence it escapes to the jet.

[Printed, 4d. No Drawings.]

A.D. 1859, August 6.—N^o 1814.

GOUDENOVE, CHARLES CLAUDE RAYMOND, and FERET, ADOLPHE.—(*Partly a communication from Marie Pierre Augustin Coquet.*)—(*Provisional protection only.*)—" An improvement in
 " gas-burners."

" In constructing gas-burners according to our invention, an
 " enlargement or box is formed below the orifice through which
 " the gas escapes. This box is capable of being unscrewed to
 " admit of a porous disc being placed thereon, and through this
 " porous disc the gas passes. The disc possesses the property of
 " purifying the gas and regulating the pressure. The ingredients
 " of which it is composed are lime, sand, soda, and water, mixed
 " together under pressure, moulded and indurated by heat. The
 " disc is placed in the burner as above described, and hermetically
 " fixed by means of a cement, so that the gas is forced to pass
 " through it."

[Printed, 4d. No Drawings.]

A.D. 1859, August 11.—N^o 1859.

HULETT, DAVID, and PRUDDEN, GEORGE.—" Improvements
 " in apparatus for the manufacture and distribution of gas and in
 " apparatus, applicable for internal or external illumination."

These improvements consist—1. In the arrangement of the retort flues in which the fire bricks or tiles surrounding the retort are supported by iron bars for convenience of removal and repair. 2. In the arrangement of iron slides for the sight holes and also for the draught holes. 3. The hydraulic main and wash vessel are formed in one, and are placed partly under the apparatus, the condensers being placed on the top of the vessel containing them. 4. The purifier and scrubber are combined (the latter forming a continuation downwards of the former) under one vessel, closed at the top, and hermetically sealed at the bottom by a lute of water, mercury, &c. 5. The trays in the purifier, on which the lime or other purifier rests, are of wicker or cane. 6. The valve is made similar to Carter's valve, but the outlet is formed so as to partially encircle the inlet, thus giving a full and free passage to the gas, the leather forming the valve being cupped or dished for the same purpose. 7. The stem of the burner passes down through the centre of the flame, this chimney being supported by means of a bracket from the side of the burner; the upper part of the chimney is kept central by a ring supported from one side of the stem; this shade is supported by an adjustable spring or wire. 8. Formation of illumination devices with coloured drops and spangles.

[Printed, 10d. Drawings.]

A.D. 1859, August 13.—N° 1874.

WATTS, RICHARD IRELAND, OFFORD, JOHN, and THOMAS, JOHN ROBERTS.—(*Provisional protection only.*)—"A method of "condensing and consuming smoke and other products of coals "and similar substances, and reducing them to useful materials."

A strong draught is created by fans revolving behind the fire, and then the smoke is drawn into a channel where it is met with jets of steam or water, and becomes thoroughly amalgamated therewith, and as the liquid flows from the fan, it is met with a further shower by which it is carried into the receiver. A second fan prepares the gases for combustion by causing them to mingle again with water or aqueous vapour, after which they pass, if necessary, to a receiver, and are purified by coke, charcoal, &c., the medium of passage through the said purifying materials being tubes of perforated metal or wire gauze.

[Printed, 4d. No Drawings.]

A.D. 1859, August 18.—N° 1901.

HYAMS, HYAM JACOB.—“Improvements in the construction of
“ wet gas-meters.”

The waste box is used as a reservoir for supplying water to a supplementary cistern above it. The water is raised to the supplementary cistern by rotating buckets or reciprocating troughs, or other equivalent lifting apparatus. If buckets are used they are affixed to the ends of the arms mounted on the axle of the rotating measuring drum; if troughs are used they are worked by the direct action of a crank arm on the drum axle. For adjusting the water level in the measuring chamber, in which the measuring drum revolves, a sliding grate is formed in the supplementary cistern, which grate, according to its adjusted height, gauges the maximum level of the water in that chamber. Or the water may be raised by a rotating helical tube, or an Archimedian screw driven by gearing connected with the drum axle. “Thus, simultaneously with the rotation of the drum, will this small supply
“ of water required to compensate for the loss by evaporation be
“ lifted from the waste water box, and be discharged into the
“ supplementary cisterns which forms the water level, vessel, or
“ chamber.” To prevent the water being tampered with, a clack valve is adapted to the supply and overflow pipe, so as to control the flow of water, and when suction or force is applied to such pipes, the clack valve closes the aperture of the same, and cuts off access to the interior of the meter.

[Printed, 1s. 6d. Drawings.]

A.D. 1859, August 18.—N° 1902.

WILSON, FREDERICK, WILSON, EDWARD BROWN, and
POWER, FREDERICK AUGUSTUS DOBBIN NUGENT.—(*Provisional protection not allowed.*)—“Improvements in the employ-
“ ment of certain refuse, or materials arising from or accruing,
“ in the manufacture of gas.”

It is proposed to apply these to certain metallurgical purposes, and to the manufacture of crucibles, melting-pots, the fire-places of furnaces, and generally of all articles intended to resist intense heat. According to this invention, it is proposed to employ the refuse accumulating in gas retorts, mixed with coke or other fuel, in the manufacture of iron, steel, and other metals, such

mixture being applicable in all those stages of the process of manufacture wherein the metal operated upon is submitted to the action of heat. The same residuum "may also be advantageously employed, when combined with fire-clay or other suitable ingredients, in the making of retorts, crucibles, melting-pots, and in the lining or covering of the hearths or fire-places of furnaces, and generally in all cases where the action of intense heat is to be resisted."

[Printed, *4d.* No Drawings.]

A.D. 1859, December 22.—N° 1913.

GRANT, DAVID.—(*Provisional protection only.*)—"Improvements in wet gas-meters."

Self-acting mechanism in wet meters.—The uniformity of the fluid is maintained by an arrangement in connection with the spindle of the measuring cylinder. A bucket wheel, or series of radial arms, are fitted to a stud projecting from the face of the water-line reservoir, which has a free communication with the measuring chamber of the meter. As the buckets pass round, a small quantity is taken up, which flows into the water-line reservoir. The surplus water flows down a waste pipe into the supply reservoir. To prevent the meter being tampered with, the water-supply tube is bent like an inverted syphon, the shorter leg entering the upper part of the interior of the meter, so that if the water is abstracted the measured gas alone passes through. To prevent the tilting of the meter for the purpose of allowing unmeasured gas to flow through, a float valve is fitted at the back of the meter, so as, if the meter be placed out of the level, to close the outlet aperture.

[Printed, *4d.* No Drawings.]

A.D. 1859, August 31.—N° 1981.

BEVERLEY, ROBERT.—"Improvements in wet gas-meters."

1. The bottom end of the water-supply pipe is turned up, either below or up to the proper water-line, and to the end so turned up is applied a valve opening outwards into the meter, and capable of admitting the water when supplied therewith, but of closing and preventing the exit of gas or the water being forced out should any fraudulent attempt be made to abstract gas through that medium. 2. The ordinary straight water supply pipe is

provided at its lower end with a valve fitted to one end of a short lever, the other end of which carries a weight or a float, which always tends to keep the valve closed, and prevent the passage of gas through it, whilst the supply of water through the pipe is unimpeded. 3. Instead of the supply pipe a feeding nozzle is employed, provided with a valve at its lower end, on the spindle of which is a float supported by the water in the meter. The float and valve are enclosed in a partition extending from the top of the meter to within a short distance from the bottom of it. A second partition, a short distance outside the first, extends from the bottom of the meter up to the true water line. On a fraudulent attempt to obtain gas through the nozzle, by previously blowing down the gas inlet pipe, the level of the water is elevated and the float rising closes the valve in the bottom of the nozzle. 4. The water-supply nozzle opens into a closed box in the upper part of the square box in the front part of the meter, which closed box communicates, by means of a hole made in the partition which separates the body of the meter with the front part of the meter, with a passage fitted inside the body, and provided with a valve. "In order to obstruct the introduction of a cotton wick " or syphon into the ordinary water-supply pipe of gas meters " for the purpose of abstracting the water level thereby, I propose " to make a double elbow bend in such pipe above the water " level."

[Printed, 10*d*. Drawing.]

A.D. 1859, September 2.—N^o 2002.

WATSON, JOHN KIPPEN.—(*Provisional protection only*).—
"Improvements in gas-meters, and exhausters, washers, and
"purifiers."

"The revolving drum or cylinder of the meter is constructed
"in the ordinary manner of wet-meter cylinders, but it has no ex-
"ternal gas casing. Each side of the cylinder is formed with a con-
"vex cover or false end. The inlet pipe passes through the centre
"of this false end or cover on the inlet side, and is turned up to
"the required height on the interior in the usual manner. The
"gas passes through the cylinder, and is received into the corre-
"sponding cover or false end on the opposite side or end of the
"cylinder, which is fitted with a gas discharge pipe in every way
"corresponding to the gas inlet pipe, the receiving end being
"turned up inside the cover, and then passed out by a central

" aperture. In this way the gas is both received and discharged
" at the centre of the cylinder. . . . As an exhauster the appa-
" ratus is constructed in a precisely similar way, the cylinder
" being simply actuated by any suitable motive power, so as to
" draw the gas into and force it out of it. The arrangement, or
" a modification of it, may also be applied to washers and wet
" lime gas purifiers."

[Printed, 4d. No Drawings.]

A.D. 1859, September 8.—N° 2052.

JOHNSON, JOHN HENRY. — (*A communication from Jean Baptiste Prudence Gire.*)—"Improvements in cocks and valves."

This invention consists in substituting for the ordinary stuffing box a thin disc of metal or other suitable material, such as vulcanized india-rubber, gutta-percha, leather, or horn, which disc is firmly secured at its edges, whilst its centre is perforated to allow of the passage there through of the spindle of the valve, which is made to embrace tightly at any convenient and suitable part thereof. The elasticity of this disc admits of the valve spindle rising and falling freely when closing and opening the valve. In combination with this disc is a helical or other spring, which is made to act directly or indirectly upon the valve spindle for the purpose of having the valve closed.

[Printed, 8d. Drawing.]

A.D. 1859, September 8.—N° 2055.

ALLSOPP, THOMAS WEBSTER.—"Improvements in portable
" gas apparatus."

The hydraulic main, washer, and condensers are arranged in one part of the apparatus, while the retort and purifier and gas holders are in separate parts, and "suitably connected with the
" former for the purpose required, and so as to be readily con-
" nected or disconnected for fixing or removal." The vessel containing the combined hydraulic main, condensers, and washer is divided into two by a partition which separates the hydraulic main from the washer. There are also two partitions partially dividing the compartments of the hydraulic main and washer. The water is maintained at the height of the latter partitions, so that any tar separated from the gas in the hydraulic main floats over one of such partitions into a receptacle provided for it, and

any tar deposited in the washer is similarly floated over the other into a similar receptacle. The condensers consist of two groups of small tubes, one rising from the hydraulic main, the other from the washer. Each group is surmounted by a dome top. The domes are connected by a tube. The gas holder is that "used in ordinary."

[Printed, 1s. Drawings.]

A.D. 1859, September 14.—N° 2096.

DEFRIES, NATHAN.—"Improvements in gas-meters."

"In place of admitting the gas directly into the small upper compartment or valve box of the outer or front chamber, and over the valve, the gas is admitted from the supply pipe into a pipe which descends below the valve, so that the gas descends into the small upper compartment or box from below the valve, and tends to keep the valve open. The lower end of the descending pipe dips into, and is closed at, its latter end by the water in the outer chamber. The gas is conveyed from the small upper compartment or box directly by a pipe into the measuring chamber of the meter without entering the outer or front chamber thereof, and the float in the outer chamber is arranged to close the valve in the small upper compartment or box in the event of the water in the outer chamber falling too low, as in meters of the ordinary construction, and there is an ordinary overflow pipe in the outer chamber by which the water level in the meter is regulated. . . . When the gas is admitted as heretofore from the small upper compartment or valve box into the front upper chamber, then, in order to prevent the meter being tilted, a descending pipe is used below the valve in which pipe, there is an opening or openings just above the proper water level in the outer or front chamber, which opening or openings are closed by the water in case of the meter being tilted."

Simplified arrangement of N° 1565, A.D. 1858, or apparatus for supplying the extra water vessel with water, consisting of two valves on the same axis, one at the upper and the other at the lower part of the water vessel, so arranged that when the lower valve is open to admit the water to flow to the meter the upper valve is closed.

[Printed, 8d. Drawing.]

A.D. 1859, September 17.—N° 2121.

RODIER, SAMUEL NEWMAN.—“Improvements in the regulation of gas to burners, which I call Rodier’s regulating gas valve.”

This invention differs from the invention patented 26th August, 1858, No. 1935, and consists, firstly, of the use of a supply pipe of cylindrical form, or tapering upwards, on the outer side of which, and near its termination, a collar or ring notched or having points on its upper edge is fixed; a light loose cap rests on this ring or collar; this cap is so constructed that as the pressure of the gas passing through the supply pipe increases the cap is lifted, and the top edge of the bottom rim brought nearer to the lower edge of the ring or collar, thereby lessening the aperture through which the gas passes on its way to the burner.

Secondly, at the base of the supply pipe is formed a guide or holder, on which an outer regulating cap of larger dimensions slides or screws; this outer cap covers the supply pipe and the rising and falling cap, and regulates the height to which the latter can be raised by the action of the gas, so that the aperture between the ring on supply pipe and the bottom of the rising cap cannot be entirely closed. To the inside top part of the outer regulating cap is sometimes fixed a pad or washer of felt or other soft fibrous material, which acts as a buffer, against which the top of the inner rising cap is pressed by the gas. By orifices in the lower part of the outer cap the impetus of the gas against the lifting cap is broken.

[Printed, *ed.* Drawing.]

A.D. 1859, September 19.—N° 2136.

COURT, JOHN.—“Improvements applicable to gas and other lamps and lights, and also to gas-stoves, for effecting more complete combustion thereon.”

“To effect this I form a ring of metal, suitable to fit on the top of a chimney or glass of a lamp, portions of the opening of which said ring I fill with a woven or plaited material or vegetable substance known as asbestos; or I bind shreds or filaments of the same on small rods fixed across the said ring, thus forming and adapting a cap or cover over the flame, the effect of which is as follows:—The asbestos becomes red hot,

" the caloric is increased in the glass of the lamp or fire-place of the stove, . . . more perfect combustion ensues, the flame is improved, and smoke prevented as the result."

[Printed, 6d. Drawing.]

A.D. 1859, September 21.—N^o 2150.

ROBINSON, GEORGE DANNETT.—"Improvements in apparatus for regulating the pressure of gas and other fluids."

1. For regulating the flow of gas through pipes or other chambers; the gas is introduced by a supply pipe into the inlet chamber of an apparatus similar to the "regulators now in use;" it thence passes to a second chamber, the amount passing being regulated by means of the valve, which is made to close or open the passage between the chambers according to the number of lights burning. The valve for regulating the pressure between the inlet and outlet chambers is carried by a cover with turned-down edges, which enters a trough containing a fluid, and moves on points an inch or more from the end of the regulator which renders the latter self-governing, at the same time acting as a break, so that when a high pressure comes from the main it cannot close the valve and cut off the gas. The cover is supported by two pieces of brass on the sides that the screws or joints work on. It is also supported by an iron or brass rod upon the top over the points or fulcrum, which prevents the cover oscillating under a high pressure "as is common in gas-regulators."

[Printed, 6d. Drawing.]

A.D. 1859, September 26.—N^o 2177.

WHITE, DAVID.—"Increasing the illuminating and heating powers of gases, and regulating the flow of gases, and improvement in the material for gas-meters, and improvement in glass and cylinder holders."

1. Mica, talc, asbestos, or other suitable material, perforated or woven, is suspended over or under globes, glasses, cylinders, or funnels, for the purpose of protecting the gaseous flame from an undue pressure of air, and for allowing space for the passage of air admitted. 2. Holder of three arms, the prong of one arm moving backward and forward by a spring for securing globes, &c. 3. Gas regulator, consisting of discs, wire gauze, perforated

metal, zinc, asbestos, woven fabric of hair, wool, or other porous substance to be confined in the tube through which the gas passes to the burner. 4. Regulator for any number of burners, consisting of a case of two chambers, single or double valve, and disc. 5. Improvements in outdoor hall and passage lamps, as also in gas stoves, &c. The bottom is closed, an opening is provided for the admission of air, and another in the upper part for the exit of heated air. 6. Apparatus for increasing the illuminating power of gases by means of a hydro-carbon, through or over which the gas is made to pass on its passage to the burner. Improvement in the material of gas measurers by substituting talc or mica plates for those of metal in the diaphragm, and thus preventing corrosion.

[Printed, 8d. Drawing.]

A.D. 1859, September 28.—N° 2194.

CATHELS, EDMUND SMALL, and SPLATT, SAMUEL.—“Improvements in gas-meters.”

This invention relates to compensating meters, and consists—1. In a mode of actuating the scoop through the medium of an excentric and elongated cam action placed below the water level. 2. In an improved arrangement of the float for regulating the inlet valve, by which the same is kept open until the whole of the water is lifted by the scoop from the supply tank, and closed upon the water being withdrawn therefrom, the gas being thus admitted only whilst the correct water line in the measuring chamber is maintained; this is effected by the length of the float spindle being so adjusted that the float is enabled to fall below the level of the bottom of the supply tank. 3. Employment of a conical hood or valve with an oblique base placed over the top of the L or inlet pipe, for the purpose of preventing the supply of gas being obtained in case of the meter being tilted forwards.

[Printed, 8d. Drawing.]

A.D. 1859, September 30.—N° 2211.

WADSWORTH, JAMES.—(*Provisional protection only.*)—“Improvements in instruments or apparatus for measuring the quantity, for regulating the pressure, and for controlling the

"flow or pressure of gas used for purposes of illumination, and
"in the construction of gas-burners."

1. The measuring vessels are two open-mouthed, vertically-moveable receivers or gas holder of known capacity, suspended over and having their rims immersed in fluid. These receivers rise and fall alternately, and thus "actuate a train of mechanism adapted for recording their movements" on an indicator. 2. Similar apparatus, omitting the index, for regulating the pressure. The adaptation is effected by "adjustment of the weight or gravitating force of the receivers, so that they shall exert a stated and uniform pressure upon the contained gas." The apparatus thus becomes a regulator and index combined. 3. Novel valve for controlling the passage of gas. The moveable part of the valve is a tube closed at the upper and open at the lower end; it is moveable up and down over the orifice of a smaller tube which is presented upward, within the cavity of the moveable tubes and projects above the surface of a fluid, into which the open end of the moveable tube dips when the valve is closed. The passage for the gas is through the open mouth of the moveable tube, and into or out of the fixed pipe projecting within it, and this passage is opened or closed as the open end of the moveable tube is above or below the surface of the fluid. 4. To preserve the water at a constant level a reserve of water is placed in a closed vessel above the level of the water in the meter, and a communication opened between the lower part of the closed vessel and the water chest of the meter by a pipe entering the meter at the proposed level of the water. 5. Improvement in gas-burners, consisting in forming the crown of brass, copper, &c., in a separate piece from the body, and uniting the two parts after the holes have been drilled.

[Printed, *ad.* No Drawings.]

A.D. 1859, September 30.—N^o 2218.

BUCKLAND, WILLIAM HENRY.—"Improvements in the preparation of peat."

This invention is an improvement upon No. 1734, A.D. 1859. The separation of the decomposed from the undecomposed parts of the peat, as taken from the bog, is effected with the addition of water by placing the peat in a perforated receptacle; it is then stirred and pressed until the black pasty decomposed

portions are strained off. The straining receptacle is so arranged that the undecomposed fibres are delivered from a separate opening, so that the separating process can be continued without interruption. The strained matter, if not of sufficient consistency to be at once moulded, is delivered into a hot-air chamber, or delivered on to a hot air plate. When sufficiently dried it is moulded and dried and hardened. This plan is termed the wet method. Another mode of drying the expressed decomposed peat consists in submitting the substance when in a divided state to a current of hot or cold air, either by directing a blast against the substance or by putting the latter into very rapid motion so as to drive off some of the aqueous parts.

[Printed, 1s. 10d. Drawings.]

A.D. 1859, September 30.—N° 2219.

HART, HERBERT WILLIAM.—(*Provisional protection only.*)—
 “Improvements in Argand and other gas-burners, partly applicable to oil and other lamps.”

The lower part of the gallery of the Argand burner is enclosed and surrounded by perforated partitions or diaphragms through which the air has to pass to the flame. A double thickness of perforated material, one fixed, the other moveable, is so arranged that by turning the loose one round the perforations for the air are enlarged or decreased, or a distributing diaphragm may be used enclosed within a casing to which air is admitted by a tap or other contrivance. A separation is made between the channel for the air to the interior of the Argand light and that leading to the exterior so as to effect the refutation of each independently. These improvements are also applicable to other gas-lights by enclosing them entirely below, and admitting and regulating the air in the manner described.

[Printed, 4d. No Drawings.]

A.D. 1859, October 10.—N° 2303.

PARKER, SAMUEL BREWSTER.—(*Provisional protection only.*)—
 “A method of, and apparatus for, revivifying oxide of iron and other agents for purifying gas containing metallic particles.”

“My invention consists in subjecting the oxide of iron or other purifier containing metallic particles, after the same has been

“ used in purifying gas, to a stirring action in a suitable apparatus
 “ open to the atmosphere wherein the particles may be agitated,
 “ exposed to the atmosphere, and then returned to the mass,
 “ My apparatus consists of a circular pan closed at bottom and
 “ open to the atmosphere in the centre, of which a shaft carrying
 “ inclined blades or agitators is set, and is provided with gear in
 “ order that rapid rotary motion may be imparted thereto.”

[Printed, 4d. No Drawings.]

A.D. 1859, October 11.—N° 2310.

HART, WILLIAM DICKSON.—(*Provisional protection only.*)—

“ Improvements in pressure-regulating apparatus for gas-
 “ burners.”

This invention consists of improved sockets or holders. These are moulded or cast in tin, alloy of tin, regulus of antimony, or other suitable metal. In casting the sockets, core pieces or internal mandrils are used to form the bore of the socket, the aperture regulating the supply of gas being either bored out or actually cast. “ Ordinary gas-burners are fitted into the sockets, and in
 “ each case a space is left between the bottom of the burner and
 “ the bottom of the wide recess of the socket, in which a piece of
 “ wire gauze or metallic packing asbestos or other permeable
 “ material is deposited, or it may be inserted in the burner itself.
 “ The gas enters the socket from the supplying pipe through a
 “ comparatively small aperture or apertures leading into the space
 “ containing the permeable material. In this arrangement the
 “ varying pressure of the gas is equalized by causing it to flow
 “ first through a comparatively small aperture or apertures into
 “ an enlarged chamber, and thence directly up the burner, and all
 “ fluctuations are avoided, and the gas flame burns steadily and
 “ brightly, whilst the gas is greatly economized.”

[Printed, 4d. No Drawings.]

A.D. 1859, October 12.—N° 2322.

THOMSON, JAMES.—(*Provisional protection only.*)—“ An im-

“ proved form of hydraulic valve and apparatus to be used in the
 “ manufacture of gas.”

This invention consists of an annular hydraulic valve for conveying gas from one purifier to another, and admitting it or closing it off from any one or more of the purifiers made use of. It

consists of a cylinder closed at the bottom, and having two pipes passing into it, one for the inlet, the other for the outlet. "One of these rises to the top of the cylinder, the other only intersects it; the raised pipe is at its upper end encompassed by another cylindrical tube, both being within the first-named cylinder. The annular space between the two inner pipes is partially filled with water so as to form a tube. Encompassing the whole is a large circular vessel, having its bottom perforated with twice as many holes or apertures as there are purifiers used. Into the holes, pipes are inserted so that their mouths rise above the bottom. Each two of these pipes form the inlet and outlet to each purifier. The outer vessel is also partially filled with water. A connecting or stand pipe puts each pair of pipes in communication; that is, the outlet of one with the inlet of another purifier. The inlet of the first purifier communicates by means of another stand pipe with the main central inlet pipe, and the outlet of the last one communicates in like manner with the main central outlet conveying the gas to the holder."

[Printed, 4d. No Drawings.]

A.D. 1859, October 12.—N^o 2329.

DAFT, THOMAS BARNABAS. — "Improvements in flexible valves."

"A flexible valve is constructed of an elastic flexible tube, by preference of vulcanized india-rubber, which is fixed at its two ends to two inflexible tubes or instruments having passages through them, and which are capable (one or both) of rotating so as to twist the flexible elastic tube until it forms a close partition across the passages or the inflexible tubes or other form of instruments, to which the two ends of the elastic tube are fixed."

[Printed, 8d. Drawing.]

A.D. 1859, October 14.—N^o 2346.

GOLDSMITH, GEORGE.—(*Provisional protection only.*)—"Improvements in gas-meters."

The ordinary measuring wheel is employed, and the gas introduced into it in the ordinary manner. The bearings of the axis

of the measuring wheel are affixed to and carried by a float made of a curved form so as to pass under the measuring wheel, and rise up on either side of its periphery and hinged at one end to the case of the meter, its other end passing into an inverted case or cover, the lower edges of which dip into the water contained in the case of the meter. "In communicating motion from the axis of the measuring wheel, a screw and screw wheel are used as heretofore, but provision is made for giving motion to the driving axis of registry apparatus from the screw wheel which is carried by the float by two projections affixed thereto, which come on either side of a cross head affixed to the driving axis of the registering apparatus; or motion may be communicated from the screw wheel by other convenient means. A flexible tube is interposed between the inlet passage for the gas, and the tube which conducts the gas to the wheel. In order to prevent gas from entering the meter when the water gets too low in the case, the float has connected to it a rod or instrument attached to a valve in the inlet passage, so that the valve is shut when the float is not upheld by the water to a certain height, and gas is allowed to flow into the inverted cover or case before mentioned, as well as into the measuring wheel, so that the pressure on the wheel and case will be constant."

[Printed, 4d. No Drawings.]

A.D. 1859, October 22.—N^o 2415.

MILL, GEORGE BICKERTON.—(*Provisional protection only*).—"Improvements in pressure regulating apparatus for gas-burners." Duplex valve or combined valve or disc.

This invention consists mainly of three parts or sections. "The lower one, which fits into the gas pipe, primarily receives the gas from the supplying tube. It has an expanded upper end screwed internally to receive a central piece of metal forming the guide and holder for the valvular regulating apparatus. "This piece of metal is bored out down the centre, the lower end of the bore being of a conical form to receive a conical valve which closes by an upward movement, and is covered in by a bottom case or shield, having a small hole or holes in it to admit the gas into the interior of the case. This conical valve has a vertical rod or spindle attached to it, which rod is passed directly up the bore of the intermediate piece of metal and pro-

“ jects out at its upper end. This upper end carries a disc or
“ concave piece of metal expanded so as always to fill up the bore
“ of the top section of the case, which section is screwed upon
“ the intermediate central piece, and forms the actual holder for
“ the burner. As the gas flows into the apparatus, it enters by
“ the minute hole or holes into the bottom case, and thence flows
“ up the bore of the central piece of metal containing the valve
“ spindle, and thus finds its way into the top section of the case
“ or chamber, and presses against the under side of the concave
“ disc on the top of the valve spindle.”

[Printed, 4d. No Drawings.]

A.D. 1859, October 22.—N° 2422.

WRIGHTSON, FRANCIS.—(*Provisional protection only.*)—“ Im-
“ provements in purifying coal gas, and in utilizing compounds
“ obtained in purifying coal gas.”

In purifying gas, the ammonia and sulphuretted hydrogen contained in it are absorbed by means of persalt of iron mixed with the solid matter of such sewage as contains sulphret of iron and carbonaceous matter, in addition to other porous matter, such as sawdust. Ammonia is absorbed from the gas by the use of gypsum, dissolved or partly dissolved in sulphuric acid; “also by
“ the use of phosphate of lime, sulphuric acid, and sulphate of
“ magnesia combined, whereby the ammonia phosphate of mag-
“ nesia, valuable as a manure, is obtained. I also use for absorb-
“ ing the ammonia gelatinous silicic acid alone, or in combina-
“ tion I obtain gelatinous silicic acid and hydrated sulphate of
“ lime from the slag of blast furnaces by the action of mineral
“ acids, and I obtain hydrated sulphate of lime by the action of
“ sulphuric acid upon alkali waste. In utilizing compounds
“ obtained in purifying gas, I distil sulphur from the residue pro-
“ duct obtained in the said purification, called ochre waste. I
“ afterwards treat the residuum with mineral acid, adding per-
“ oxide of manganese to peroxidize the iron when necessary. I
“ thereby obtain persalt of iron to be used in gas purifying.
“ After use the ammoniacal salts are extracted by means of water,
“ and the residuum is boiled with milk of lime. Peroxide of iron
“ is thereby obtained in the solid form, and the cyanogen com-
“ pounds in solution. The peroxide of iron is in a suitable state
“ for purifying gas.”

[Printed, 4d. No Drawing.]

A.D. 1859, October 24.—N° 2424.

DOWIE, ANDREW LINMERE.—(*Provisional protection only.*)—
“Improvements in gas-burners and in pressure-regulating apparatus for the same.”

1. The top of the burner is bell-shaped or rounded off with a pretty broad flange all round it. Through this flange inclined holes are bored up from beneath in such a way as to conduct jets of air diagonally into and across the gas flame.

2. Improved sockets cast in brass or other suitable metal in two separate sections and screwed together. The lower section consists of a tubular portion of small diameter, which fits into the end of the gas-pipe. The extreme lower end of this tube is formed with three or other number of angular faces, in each of which is bored a small hole, so inclined as to diffuse the entering gas in the interior of a conical chamber, which forms the upper end of this lower tubular piece. The upper section of the chamber or socket is formed with a cylindrical chamber at its lower part, where it is screwed on to the top of the lower section, and at the top of this cylindrical portion is a narrow passage or neck opening into the interior of a spherical chamber, in the top of which is the recess or socket for the burner. The upper portion of the bore of the cylindrical chamber is of a conical form, and in it is placed a perforated disc of pasteboard over a disc of thin cloth. The entering gas is diffused across the interior of the lower and cylindrical chamber beneath, the two permeable discs within it, and then escapes through the narrow neck passage above into the interior of the spherical chamber or reservoir above, whence it passes at once to the burner.

[Printed, *4d.* No Drawings.]

A.D. 1859, October 25.—N° 2434.

GREAVES, HUGH.—“Improvements in moulding and casting gas, water, and other pipes, sash weights, and other articles, and in cleaning some of the same from the sand.”

This invention consists—1. In the employment of centres or gudgeons, at or about the centre of the flask or moulding box, for enabling the flask, after the pipe or other article has been moulded vertically, to be placed at an angle while the pipe or other article is being cast. 2. In forming bands or belts in the sand before the pattern is wholly withdrawn. 3. Moulding pipes vertically

entirely in green sand, "which sand forms its own core without the aid of such cores as are at present employed." 4. In moulding pipes, sash weights, and other articles "by pressure instead of by ramming the sand as now practised." 5. In an adaptation of the principle of the lever barrow to the purpose of removing flasks or moulding boxes from the moulding table to the place of casting. 6. In cleaning the inside and outside of pipes from the sand while they are revolving by means of a rough lathe.

[Printed, 10d. Drawing.]

A.D. 1859, October 26.—No 2445.

KAY, JOHN ZUILL.—"Improvements in gas-meters, and in apparatus for maintaining or preserving the levels of liquids."

For ordinary meters, two separate hydraulic chambers are used, communicating with each other at their lower ends. One chamber is longer than the other, and has an opening at its upper end, leading into the drum case, through which the gas passes from the measuring drum to the discharge pipe, and thence to the burners. The other chamber has a small tube or dip-pipe in connection with, and leading from, its upper end, dipping into the water a little below the proper water line. Into that chamber, which is in communication with the drum-case, is introduced a discharge or outlet pipe, which is carried down from the top of the meter to within a very short distance of the proper water line, and is curved forwards towards the outside of the meter, its open lower end being flattened and elongated so that the same area may still be preserved. Into this chamber there is also introduced the filling tube. Both chambers are thus filled with water before any gets into the drum-case, in which, flowing through the dip-pipe, it rises to its proper level, and discharges itself into the waste water box through the overflow. Should the water fall below the mouth of the dip-pipe, the discharge pipe is sealed, and gas cut off from the burners until the meter is again filled with water. "This arrangement dispenses altogether with the unsatisfactory valve and float as ordinarily used." Three modifications of this principle are shown. In the first, the hydraulic valve is introduced in to the front chamber of the meter, and to prevent tilting the overflow pipe is carried from the back along the bottom, and thence into the waste water box in the front of the meter. The gas is introduced, first into the waste water box,

and then by a close bent syphon pipe, into the measuring drum. In the second, the hydraulic valve is introduced into the front of the meter, and the register ring apparatus inlet pipe, overflow pipe, gas syphon, and waste water box are arranged in front. In the third, the fountain equilibrium chamber, hydraulic valve, and combinations are placed at the back end of the meter, and on the front of the registering apparatus, inlet pipe, gas syphon, overflow pipe, and waste water box.

[Printed, 1s. Drawing.]

A.D. 1859, November 2.—N^o 2496.

HESS, RICHARD HEINRICH.—(*Provisional protection only.*)—
“Improvements in gas-burners.”

“My improvements consist in making gas-burners, by pressing
“the materials used in the manufacture of porcelain or china in
“suitable moulds, and burning the same afterwards to the necessary degree of hardness. I do not confine myself to one particular composition of porcelain or china, but use all the
“different materials used until now in the manufacture of porcelain or china, the principal part of the composition being
“always clay or other argillaceous material. The burners may
“be made of porcelain or china, and afterwards inserted in tubes
“made of iron and other metal, or they may be made wholly of
“porcelain or china.”

[Printed, 4d. No Drawings.]

A.D. 1859, November 3.—N^o 2501.

BACON, CHARLES.—“Improvements in globes and shades for
“gas-lights and oil or other lamps.”

The invention consists in forming the globes and shades with an interior globe or convex lining, the space between the two being filled with water or other liquid, clear or coloured as desired. Or, instead of the inner globe or lining, a convex or suitably-shaped chimney may be attached or secured to the lower part of the outer globe, leaving the space between the interior of the globe and the chimney for the reception of water or other liquid as above stated. The intervening space in either case may be left open or covered with a cap. The inner globe may be formed either of solid glass bored or cut through the centre or in compartments. “Where much light is required, the burners may be

“ placed around the inner globe, which may be either solid or
 “ hollow and filled with water, the centre opening being used for
 “ the passage of the oil or gas tube which supplies the burners ;
 “ or the burners may be arranged in a triangular, quadrilateral,
 “ or other form around the inner globe or globes, and an outer
 “ double globe filled with liquid may also be used. Thus the
 “ light is reflected from one globe to the other, increasing the
 “ power of the light, which may still further be increased as
 “ required by the adjustment of reflectors.”

[Printed, 4d. No Drawings.]

A.D. 1859, November 14.—N° 2574.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from Henri Auguste D'Arbel.*)—"Improved apparatuses for the concentration, distribution and application of the heat evolved by gas, oil and other lamps."

1. Stove of which the case, which forms a main feature of the apparatus, is composed of the furnace or upper section, and the heat chamber below. A moveable lid is fitted to the case, which is open below and pierced in its circumference with orifices, closed at will by any suitable means. Heat is supplied to the apparatus by one or several lamps or gas-burners, placed so that the chimneys penetrate about an inch in the heat chamber, while the light produced serves for illumination of the apartment. The accessories for preserving the heat in the interior, consist of an inner coffer within the heat chamber, provided with a moveable perforated lid to allow of the escape of steam, and moveable "heat concentrators and directors," fitted in the interior of the inner case and in the heat chamber. In the latter are placed the large and small metallic chimneys and the smoke consumer. The concentrators are composed of a cylinder and a series of cones, by the adjustment of which the heat can be directed or annulled at any point, "affording, as required, a current of hot or cold air." Several boilers or digesters are shown in the drawings, "the essential feature of which is the multiplication of the heating surfaces."

[Printed, 10d. Drawing.]

A.D. 1859, November 15.—N° 2588.

CHALMERS, CHARLES. — "Improvements in gas-stoves for heating buildings, apartments, and other similar places."

A closely fitting door is made in the stove opposite to the part where the burner is arranged, for the purpose of igniting the gas, and on the other side of the stove there is an inlet tube, which extends inwards to the centre of the stove, and is then bent vertically upwards. The tube is made sufficiently large to admit of the gas-pipe and burner being fitted within it, and at the same time leave an annular passage for the admission of air through it. A Bunsen burner is fitted at the end of the gas-pipe, the flow of gas being regulated by an ordinary cock outside the stove. A secondary tube of metal, similar to an elongated cylindrical glass chimney, is fitted to the air pipe in which the burner is arranged. This tube extends upwards, nearly to the top of the stove, and serves to convey the heated air directly to the upper part of the stove, where the heat is absorbed by the surrounding metal of the chamber, and given off to the apartment. The vitiated air and products of combustion are carried off at the lower part of the stove by means of a pipe carried out from the bottom of the stove. As the external air flows in through the inlet pipe, and passes around and through the gas flame, it becomes heated, and impinges against the top of the stove with a portion of its heat, "and so becomes specifically heavier in proportion. The current of heated air as it ascends continually, occupies the place of the cooler portion of the air, and then the vitiated air is caused to descend and pass off by the outlet pipe . . . carrying with it little or no heat."

[Printed, 8d. Drawing.]

A.D. 1859, November 16.—N° 2598.

JOHNSON, WILLIAM.—(*A communication from George Mill.*) — (*Provisional protection only.*) — "Improvements in gas-burners."

This improved gas burner is intended to be used with the "ordinary burners at present in use." It consists of a tubular cap of thin metal, having a wide internal diameter, so as to fit by its lower open end over an existing burner. The top of the burner is in the form of a solid convex end, through which a vertical slit is sawn to form the actual burners' aperture for the gas and produce a broad flat flame. The gas issuing from this burner is received into the enlarged reservoir of the tubular cap, and then passes slowly off through the burner slit. The reservoir intervening between the common burners beneath, and the burner

slit in the top of the cap above, act as a pressure regulator to prevent flickering and inordinate forcing of the gas.

[Printed, 4d. No Drawings.]

A.D. 1859, November 17.—N° 2607.

LAMING, RICHARD.—“Improvements in obtaining alkalies and “alkaline compounds.” These are, in reference to this subject, said to be, “obtaining impure solution of carbonate of ammonia, “by scrubbing or washing impure coal gas lastly with pure water, “firstly, with the product of that water washing, and immediately with either the joint products of the last and first “water washings, subsequently to their desulphuration, either “wholly or in part, after being mixed with the raw ammoniacal “or gas liquor from the condensers and mains, or with water “containing unsaturated ammonia from other sources.” On passing “a current of air or other elastic medium through a “porous mixture of sulphuret of sodium and a carbonate of “ammonia,” in a moist state the ammonia escapes as hydrosulphate, and may be made to pass over red-hot carbonate of lime, producing carbonate of ammonia, “for decomposing a “fresh portion of the sulphuret of sodium, or applied to other “purposes,” or the hydrosulphate of ammonia is received “into “foul coal gas, or into cold water that may afterwards be used “to wash or scrub such gas.” Sometimes the gases from the soda vessel are received “into a gas dry purifier, or other appropriate vessel charged with a revivifiable oxide of iron or manganese, made previous by sawdust,” &c., by which the sulphuretted hydrogen is absorbed and the ammonia is set free, and sometimes “the free ammonia in an elastic state” is conducted “into impure gas, to combine it in great part with the carbonic acid which the gas contains,” and “afterwards by washing or “scrubbing the gas with water, recover it in solution so combined for further use in decomposing sulphuret of sodium,” or for other purposes. Three ordinary scrubbers are employed and consecutively.

[Printed, 6d. No Drawings.]

A.D. 1859, November 18.—N° 2613.

PINCHBECK, JAMES.—“Improvements in consumers’ compensating gas-meters, which are partly applicable to ordinary “consumers’ meters.”

This invention consists—1. In the mode of introducing the gas to the syphon pipe without being in contact with the outer case of the meter, by means of a dip or tube, with a hydraulic seal formed by the water in the front trough. The outer end of the tube is made gas-tight to a chamber above, in connection with which is the inlet valve. 2. In the mode of elevating the supply water by means of a cam fixed at the end of the drum shaft. Upon the cam rests the arm of a lever which is attached to a pivot, upon which is fixed the scoop or spoon; consequently, as the said lever is alternately raised and lowered by the action of the cam, a similar motion is imparted to the scoop or spoon, thus raising a drop of water at every revolution of the drum shaft. 3. In the mode of regulating the height of the valve by means of a screw cut in the lower extremity of the valve rod, to which is fixed the valve “as usually arranged in gas-meters.” 4. In the mode of working the valve by the float. The float is pierced by a cylinder through its vertical axis, which is water-tight. Inside this cylinder is another cylinder or tube made gas-tight at the top to the inlet chamber of the gas, the bottom being sealed by water in the meter. Across the under side of the float is a bridge piece, to which is fastened the valve rod described in 3, working inside the inner tube or cylinder. 5. In the general arrangement of the reservoir, and the mode of obtaining the water level therein by means of a notch cut in the partition plate.

[Printed, 10d. Drawing.]

A.D. 1859, December 1.—N° 2717.

FOURNIER, CHARLES ANTOINE.—“A process and apparatuses intended to find out the escapes of lighting gas from the conveying pipes, and to determine the precise leaking places of the said pipes.”

The apparatus for the first object is termed “a revealer,” and is simply a double-branched barometrical tube in connection, one side, with the pipe conveying the gas from the gas-meter, and on the other with the delivery pipe, the connecting cock being turned off when the pipes are filled with gas. If there be no escape, the coloured liquid in the barometrical tube will keep its level in both branches of the said tube, whilst if there be an escape of gas, the greater pressure in the branch connected with the feed pipe will cause the liquid to rise in the other branch. The barometrical

tube may be connected with both ends of the stop cock. The apparatus for finding the points of leakage is composed of a glass receiver containing volatile alkali, and which is volatilized by any convenient means, and the vapour introduced into the delivery pipes; then, if a glass rod dipped in muriatic acid be carried along near the said pipes, it will, on coming near the escape, be suddenly surrounded by thick white vapours, and a white substance will be deposited on it.

[Printed, 10*d*. Drawing.]

A.D. 1859, December 3.—N^o 2745.

CURLEY, EDWIN AUGUSTUS.—“Improved mechanical arrangements or contrivances for measuring, registering, and regulating the flow of liquids, and likewise for measuring and regulating the passage of fluids and vapours.”

The invention consists—1. Of a floating syphon, to which a “vernier” is attached, the float serving to control the pressure on the orifice of the syphon, so that the fluid shall flow uniformly. The vernier reads against a scale attached to the stationary part of the apparatus, and thus serves to indicate intervals of time or the quantity of fluid passing through the syphon with extreme minuteness. 2. Mechanism for measuring and regulating the flow of larger quantities of fluid. In regulating gas a conoidal ball is placed near the meter, or made to form part of the apparatus. The valve is actuated by a float gas holder or diaphragm which moves with the varying pressure. When a float or gas holder is used, a second self-acting valve is used to prevent explosion. “Where the pressure is strong enough to require it, I balance the valve by luting it, and introducing the gas behind it, or by making it double and compensating. Should the burners, for any reason, not be uniform after the pressure on the mains has been properly adjusted with the controller valve, the passages to the burners which are too free are partially closed by means of an adjustable screw, which, once adjusted, is a fixture, and does not interfere with the taps, while it effectually controls the excess of pressure.” To control the current of incandescent gas when burning at a low pressure, I use pieces of glass mica or other suitable substance, in connection with one or more secondary jets if necessary, for the purpose of inducing a steady current in the required direction. For

"measuring the gas, I use two-gas-holders, alternately filling
 "and emptying, and turning clockwork by their motion. I
 "keep the luting medium used always at the same height,
 "by using a large quantity thereof, and floating the meters as
 "well as the gas holders in it, or by balancing the lute vessel so
 "that it will rise as the lute evaporates."

[Printed, 1s. 4d. Drawings.]

A.D. 1859, December 6.—N^o 2757._{ms}

COIGNET, FRANÇOIS.—"Improvements in the manufacture of
 "beton, or composition applicable to purposes of covering, build-
 "ing, and construction, and for various uses as artificial stone."

Among numerous uses to which the improved beton may be
 put are "gasometer wells," "fluid-tight channels for gas," and
 "tubes for gas." The composition has lime for its base, and the
 object of the invention is to produce it in an agglomerated and
 plastic state with but a comparatively small quantity of lime. The
 lime is first slightly or partially slacked, still remaining in a state
 of powder. The slacking is then completed, and the lime brought
 into a thick pasty, adhesive, and plastic condition "by crushing
 "it with a very small quantity of water by forcible and sustained
 "mechanical means before adding any other ingredient, thus
 "the amount of water necessary for the complete slacking of the
 "lime is reduced, and an unctuous plastic binding paste ob-
 "tained, which is then combined with the other constituent
 "materials."

[Printed, 6d. No Drawings.]

A.D. 1859, December 10.—N^o 2805.

FARQUHAR, JAMES.—(*Provisional protection only.*)—"Improve-
 "ments in gas-meters."

1. Adaptation in wet gas meters of the principle known as the
 "fountain lamp" (where the oil is above the light), the space
 above the water level in the chamber formed against the drum
 case being used as a fountain to maintain a merely constant level
 in the drum case. The communication between the front of the
 drum case is similar to that of the lamp, the passage being made at
 or near to the level at which the water in the drum case is to be
 maintained. The action is also the same, bubbles of air or gas
 passing to the fountain whenever the level is disturbed, and thus

replacing the water. After filling the meter in the usual way, the fountain is filled as follows :—" All ingress or egress to and from the meter is closed, except the feed pipe and the passage by which the air is carried off, whilst the fountain is filling. After the fountain is filled, the passage for carrying off the air is made air-tight, a cock or two at the burners opened, the waste water plug taken out, the waste water runs off. The meter is then ready for action." 2. A vessel open at one end, and of any shape, is used as a float to open and shut the inlet valve. 3. Peculiar combination of bent pipes, forming "such a depth of hydraulic seal that the water cannot be forced out by the pressure of the gas, and if suction be applied the waste pipe is only partly emptied, as there is no pressure on the fountain in that direction, and consequently no gas can be extracted from the meter in that way." This plan dispenses with the waste water box.

[Printed, 4d. No Drawings.]

A.D. 1859, December 17.—N° 2871.

HILLS, FRANK CLARKE.—"Improvements in means and apparatus for purifying gas, and in the preparation and treatment of oxide of iron to be used in such purification, or for other purposes."

1. Improvement on No. 13,912, Old Law, by which the gas was mixed with a small per-centage of atmospheric air for the purpose of renovating the oxide. It having been found, however, that the deposition of sulphur clogged the oxide and rendered it impervious to the gas, "the gas is caused to pass downwards through the oxide purifying material in the purifier, instead of upwards as is usually done, and I take care that no tarry matter comes forward with the gas. By thus directing the gas the upper portion of the purifying material takes the most sulphur from the gas, and has the greatest tendency to become clogged, but being at the upper part of the purifier, it is more easily stirred or broken up than when the gas is admitted at the lower part." The purifying material is placed in circular purifiers similar to those used for drying lime. Horizontal arms or stirrers are fitted to a vertical shaft within the purifier. Several forms of arms are given.

[Printed, 1s. 4d. Drawings.]

A.D. 1859, December 24.—N^o 2941.

SMITH, EDWIN.—(*Provisional protection only.*)—"Improvements in ornamenting metal pipes or tubes."

"This invention relates to a new mode of ornamenting or decorating metal pipes or tubes suitable for gas fittings, and other purposes where ornamental pipes or tubing may be advantageously employed. According to this invention it is proposed to ornament metal pipes or tubes by engraving or cutting ornamental designs upon their surfaces by the aid of a self-acting screw-cutting lathe, or other similar mechanical contrivance."

[Printed, 4d. No Drawings.]

A.D. 1859, December 29.—N^o 2970.

NEWTON, ALFRED VINCENT.—(*A communication from Charles de Jongh.*)—"Improvements in the mode of, and apparatus for, submitting yarns or threads to the action of gaseous and liquid bodies."

The object of the invention is to submit lengths of thread while in motion to the action of liquid or gaseous bodies, for the purpose of dyeing or drying the same, and preparing it for spinning or weaving. This is effected by winding the threads round drums or reels in the form of a helix, or one coil of thread beside the other, a space being left between each coil. These drums or reels have a continuous rotary motion, and deliver out of the machine as much thread at one end of the helix as they take up at the other. "By this arrangement any length of thread can be collected and submitted to the action of the operating agents, sufficiently long to ensure the perfect action of such agents."

[Printed, 10d. Drawing.]

A.D. 1859, December 29.—N^o 2979.

CLIFF, JOSEPH.—"An improvement in the manufacture of clay retorts."

The object of the invention is to prevent cracks, fissures, and roughness, and obtain a semi-enamelled surface "which will in a great measure prevent the escape or filtration of the gas, and the adhesion of carbon to the inner surface of the retort. The retort is coated internally and externally with a mixture principally composed of powdered fire-clay, previously bound at a high

"temperature. . . . The powder of flint or sandstone, or of
"fire-clay of any kind will accomplish the same end."

[Printed, 4d. No Drawings.]

A.D. 1859, December 30.—N° 2981.

SMITH, WILLIAM.—(*Provisional protection only.*)—"Improve-
"ments in the manufacture of fire-clay gas retorts."

The invention relates to the use of certain additional ingredients in the manufacture of fire-clay gas retorts, for the purpose of increasing the durability and improving the refractory nature of such retorts. In carrying out this invention in practice to the ordinary fire-clay from which retorts are at present made, there is added a certain proportion varying from $\frac{1}{4}$ th to $\frac{1}{2}$ th of ground and reduced quartz, and about $\frac{1}{3}$ rd more or less calcined fire-clay properly ground or reduced. This composition is still further improved by a small proportion of coke or carbonaceous matter.

[Printed, 4d. No Drawings.]

1860.

A.D. 1860, January 3.—N° 13.

HULETT, DAVID.—(*Provisional protection only.*)—"Improve-
"ments in apparatus for measuring gas and an apparatus for
"indicating the pressure of gas."

This invention consists—1. In making the front or box in gas meters of an oval or circular form, "for the purpose of reducing
"the labour in the manufacture thereof." 2. In placing the valve in the passage to the outlet, "in order that the pressure of the
"gas may tend to raise the valve instead of depressing it as in
"ordinary meters." 3. In placing the valve at the back of the meter, "therefore should the meter be tilted the valve will fall
"and shut off the gas." 4. In making a communication between the charge spout and waste water box with the upper part of the meter, to prevent gas from being fraudulently extracted by drawing off the water. 5. In making the water-line reservoir as small as possible, so that the displacement from the same shall not interfere with the measuring chamber. 6. An improved mode of showing the water line by means of an indicator operated upon by the

water in the meter. 7. In attaching the spout or syphon to the waste water box by means of a union or screw, "to give greater facility for its removal." 8. In working the finger of the dial in gas-pressure indicators by means of a curved rack or toothed segment, attached to a float operated upon by the water in the indicator, and guiding the float by means of a rod fixed to it, the other end of which turns freely on a hinge joint or other similar means attached to any convenient part of the indicator. 9. In working the dial of pressure indicators by means of an inverted cup floating in mercury, a rod being attached to the top to actuate the finger of the dial, "or by having mercury in an inverted syphon, with a rod working the hand or finger of the dial, or working over a pulley similar to the action of the barometer hand."

[Printed, 4d. No Drawings.]

A.D. 1860, January 3.—N^o 15.

HUDSON, FREDERIC.—"Improvements in gas-meters."

A series of troughs are set zig-zag one to another, the succeeding troughs being inclined to each other, so that the lowest, when caused to vibrate, delivers the water taken up by it into the end of that next above it, and so on in succession, the excess of water flowing back and being again raised to the vibrating troughs. The vibratory motion is given by a crank pin on the axis working the registering apparatus. The pin works through an opening in the axis, on which the combined series of troughs are mounted alternately on the curved sides of the opening and on the troughs, so to incline the latter first in one direction and then in the other. On any attempt to work the meter in the reverse direction, the working of the meter is stopped by the crank pin coming against a stop at one side of the opening in which it works. "One or more of the lower troughs is constantly in the water so long as the supply is not used up. Provision is made to stop the supply of gas to the meter by closing the supply valve as soon as the series of troughs have no water to lift, by means of a lever which has a trough at one end, from which the water is taken by the lowermost of the series of troughs, and as soon as all the water has been taken, the superior weight of the other end of the lever is brought to act on the supply valve of the meter and cut off the supply of gas."

[Printed, 10d. Drawing.]

A.D. 1860, January 4.—N^o 21.

DAVIES, GEORGE.—(*A communication from Monsieur Legris.*)
—"Improvements applicable to nibs or burners for gas."

The invention consists principally in applying to such nibs or burners metallic wicks, made of twisted or woven wire or perforated plates, which guide the gas in any required direction, and divide, enlarge, or expand the flame, and, at the same time, being elevated to a high temperature, elevate that of the gas also, causing it to mix more intimately with the air, thereby rendering the combustion more easy and more perfect. Another improvement consists in forming a nib with one or more holes pierced obliquely, and so arranging the wick that the gas shall impinge against its surface, and produce a large flat flame similar to the bat's-wing burner.

[Printed, 8d. Drawing.]

A.D. 1860, January 13.—N^o 92.

HARRISON, EDWIN, and SCOTT, JOSHUA.—"Improvements
" in gas meters."

"We employ a spoon or feeder for supplying water from the cistern to the interior of the meter, and give it motion by causing a cam or excentric on the upright shaft to act on an arm or lever on the spoon shaft, the spoon supplying the water according to the speed of the upright shaft. There is a pipe communicating with the cistern and the interior, and also a hole above, so as to maintain a proper level and prevent overflow. We also, when desired, separate the float from the water cistern by means of a partition, thus rendering the level of the water in the interior perfectly independent of the water in the cistern."

[Printed, 10d. Drawing.]

A.D. 1860, January 17.—N^o 124.

GOULSON, JOB.—"Improvements in gas-meters."

The supply pipe enters the valve box, and from it the gas passes into the upper chamber of the reservoir of extra water. It thence passes by a pipe into the measuring wheel, "and in place of the float which acts on the admission valve being external of the measuring compartment of the meter, as is usually the case, it

“floats in the water contained in the measuring compartment of the meter, so that it will be acted on by the gas which has been measured in place of being acted on by the gas before it has entered the measuring compartment of the meter.” The float is attached by a rod to a lever, on one end of which is the valve and on the other a balance weight. The rod passes up a tube through the float, and by means of a screw nut regulates the adjustment of the float and valve. Below the lever and lower end of the rod is a ball of the specific gravity of water, consequently so long as it is immersed in the water of the reservoir it is not called into action, but on the water falling it drops down the float and closes the valve. The water in the extra supply reservoir is pumped into the measuring compartment by a counterbalanced lever, worked by a spiral on the axis of the registering apparatus. At the lower end of the pump barrel is a valve, and the parts are so arranged that the motion of the plunger causes the due opening and closing of the valve.

[Printed, 10d. Drawings.]

A.D. 1860, January 21.—N° 159.

SPEDDING, BENJAMIN JOSEPH.—(*Provisional protection only.*)
—“Improvements in apparatus for generating gas from oily and fatty substances, and in coolers and holders or gasometers.”

The retort preferred is circular, with the open part or mouth upwards. The edges of the mouth form a groove to receive a lid with inverted flanges, the groove being filled with lead or other metal liquefying at a low temperature. On the outside are two flanges forming a flue. Inside the lid, passing downwards into the retort, are chains, rods, worms, &c., the motion of which prevents the deposit of carbonaceous matter, “the great difficulty hitherto in making gas from oleaginous substances.” The oil, &c., is admitted through the lid by regulating taps, syphons, &c. and on the lid is a safety-valve to allow an escape of gas when the holder is full. The outlet tubes are arranged in various ways by the side or through the bottom of the retort. They are provided similarly to the retort with means for preventing deposit. The condenser consists of a vessel of convenient shape partially filled with a constantly flowing stream of cold water. The gas enters at the top, and is made to travel over a considerable surface by the lid having a series of projections downwards into the water. The

gas-holders are of two kinds, stationary in the form of a quadrant, with one of its sides open, placed in a well supported with hinges and balanced by weights. The gas is admitted at the highest point by a flexible tube which serves as inlet and outlet by having a stop-cock between it and the condenser. 2. Holder for steam-boats, &c., consisting of "a vessel of any shape provided with a tap at the top and bottom for the admission and egress of water. This holder is alternately filled with water and gas. Suppose it filled with the former and the space required for the latter, by opening a cock in the bottom, a vacuum will be created for the gas. To withdraw the gas it would only be necessary to admit water to displace the gas. The quantity admitted would regulate the pressure."

[Printed, 4d. No Drawings.]

A.D. 1860, January 25.—N° 185.

YATES, FREDERIC.—"Improved apparatus for generating certain gases to be used as fuel, and as reducing agents in metallurgic and other operations, and improvements in furnaces to be heated and worked therewith."

1. Instead of the "disadvantageous plan of causing the air to pass into the carbonaceous matter only, at or about the lower end of the decomposing chamber, and to flow in an upwards current through it," this invention proposes "admitting the air by one or more tuyeres of a certain construction at or about the upper end of the closed decomposing chamber, and thence forcing it in a current downwards through it, whilst charging the decomposing chamber with the carbonaceous fluid." It is preserved air-tight by a cast-iron hopper, fitted with an air-tight moveable cover and a conical stopper, or a hollow drum is used fitted air-tight into an outer cylinder, and made, when turning on its axis, to deposit its contents in the chamber. Or an air-tight cover is fitted on the top of the chamber itself, and below it a horizontal slide upon which the carbonaceous matter rests, and which when withdrawn allows its load to fall into the chamber, or a hopper with an air-tight cover is placed at one side of the generator with a slide working up and down vertically or obliquely. The gas generators are placed in close juxtaposition to the furnaces. To produce "the proper combustion, or any special condition of these gases," a tuyère of a peculiar form is placed

outside and at the back of the generator, about the level of and behind the fire bridge, pointing into the centre of the furnace or the materials to be heated. 2. The heat is supplied to the improved furnaces, which are oblong or spheroidal in shape, the sole being dish shaped and the roof elliptic, by "two or more" either simple or compound gas generators, herein-before described, placed either at the ends or at the sides, that is, in a direct line either with the long or short axis of the furnace, or at any other angle with reference to those axes. In order to heat the atmospheric air used to burn the gases from these generators, I employ for this furnace arrangements similar to those described above, but placing in any case the heating pipes at right angles to a straight line between any two generators, and at the opposite side of the working door of the furnace."

[Printed, 1s. 4d. Drawings.]

A.D. 1860, January 26.—N^o 198.

BANKS, THOMAS.—(*Provisional protection only.*)—"Improvements in gas pipe tongs."

This invention consists in making the claw adjustable on the handle of the tongs, by connecting it by means of a pin joint to a boss having an internal screw thread tapped therein, and fitting on to a screw thread on the handle near the end thereof. The end of the handle is formed with a serrated head which, in combination with the claw, constitutes the gripping or holding portion of the tongs. "It is thus obvious that by adjusting the claw nearer to or further from the end of the handle, by the aid of the screw parts above referred to, the tongs may be adapted to various sized tubes, pipes, rods, or bolts, or if used as a spanner, to different sized nuts."

[Printed, 4d. No Drawings.]

A.D. 1860, January 28.—N^o 216.

NICHOLSON, JAMES.—(*Provisional protection only.*)—"An improved main cock or tap for regulating and indicating the supply of gas."

This invention consists "of a cock or tap with a plug, to which is fixed a pointing hand moved by means of a lever, which lever works over a dial-plate. The said dial-plate indicates the different supplies of gas desired for consumption. I have cast on

“ each side of the cock or tap an elbow, the angles of which can
“ be varied to suit situations. The said elbows are for connect-
“ ing the iron tubes with the main cock or tap at the back of
“ the dial-plate, and in the body of the main cock or tap is fitted
“ a lubricator or apparatus for greasing the said main cock or
“ tap.”

[Printed, 4d. No Drawings.]

A.D. 1860, February 2.—N^o 268.

INGHAM, WILLIAM, and HINCHLIFFE, WILLIAM.—(*Letters Patent void for want of Final Specification.*)—“ Improvements in
“ apparatus for applying steam and other vapours, gases, or fluids,
“ to the production of motive power, and which may also be used
“ for a pump or gas exhauster or other similar purpose.”

Within a hollow cylinder is placed a solid cylinder of less diameter, so that one point the circumferences touch. The steam, gas, &c., is let into the space between the two cylinders at one side of the point where they touch, and is allowed to escape at the other. The steam or other vapour drives a lever or piston attached to the inner cylinder, and so adjusted as to adapt its position in revolving to the varying width of the space between the cylinders, and those to work steam-tight in that space. Where the force of the vapour consists of weight or pressure rather than expansion, the cylinders may be made concentric, and the admission and escape of the vapour arranged “at such points as will secure the
“ greatest amount of power.” Or the cylinder to which the piston is attached may remain stationary, and power be generated by the revolution of the other cylinders. “The apparatus above described
“ may also be driven by extraneous power, and used for the purpose of creating a vacuum by the revolution of the lever or
“ piston. It may thus be used as a pump or gas exhauster, or for
“ any similar purpose in which a vacuum is required.”

[Printed, 4d. No Drawings.]

A.D. 1860, February 2.—N^o 277.

TOOTH, WILLIAM HENRY.—“ Improved machinery or apparatus to be employed in the manufacture, melting, or refining
“ of iron and steel, and in the manufacture of puddled steel and
“ wrought iron.”

The raw material is placed in a horizontal rotating cylinder, into which the flame and combustible gases from a furnace or gas generator are conducted, and where they act upon such materials, the latter rolling over and over as the cylinder rotates. On passing out of the opposite end they are carried off by a flue or chimney. Either the furnace and gas generator or the rotating cylinder must be made moveable for repairs. The moveable furnace or fire-place is adapted to the rotating chamber so as to admit atmospheric air, when required, all round the joint between the moveable fire-place and the rotating cylinder, to promote the combustion of the combustible gases directed into the rotating cylinder. The part of the flue nearest the exit aperture is sometimes provided with a moveable cap or cover for the convenience of charging and discharging the rotating cylinder. The rotating cylinder is of iron, lined with fire-stone or other composition that will vitrify or glaze by the application of heat, and thus resist the action of molten metal. It is mounted on anti-friction rollers. "Instead of a furnace or fire-place of the ordinary construction, . . . I sometimes propose to make use of a gas-generating furnace, to which a blast may be adapted for blowing the gases therefrom into the rotating cylinder. By this means I am enabled to regulate the quality and quantity of the gases employed, and the intensity of the blast, and thus have the operation in the rotating cylinder entirely under control."

[Printed, 3s. Drawings.]

A.D. 1860, February 4.—N° 301.

LAUNAY, CHARLES THEODULE, and DE VERNEZ, AUGUSTE MARIE ALEXANDRE DOMINÉ.—"An improved valve or cock for regulating or stopping the passage of gas, steam, water, or other fluids."

The improved plug is constructed to prevent the escape of any fluid between the plug and the seat or barrel of the valve. For this purpose the upper surfaces of the seat and of the plug are provided with circular grooves concentric with the plug's axis. The outside of the top of the seat has a screw cut on it to receive a hollow cup, india-rubber or other elastic material being interposed between the cup and the seat of the plug. The lower end of the cock may be similarly provided, or the lower end of the

“ each side of the cock or tap an elbow, the angles of which can
“ be varied to suit situations. The said elbows are for connect-
“ ing the iron tubes with the main cock or tap at the back of
“ the dial-plate, and in the body of the main cock or tap is fitted
“ a lubricator or apparatus for greasing the said main cock or
“ tap.”

[Printed, 4d. No Drawings]

A.D. 1860, February 2.—N^o 268.

INGHAM, WILLIAM, and HINCHLIFFE, WILLIAM.—(*Letters Patent void for want of Final Specification.*)—“ Improvements in
“ apparatus for applying steam and other vapours, gases, or fluids,
“ to the production of motive power, and which may also be used
“ for a pump or gas exhauster or other similar purpose.”

Within a hollow cylinder is placed a solid cylinder of less diameter, so that one point the circumferences touch. The steam, gas, &c., is let into the space between the two cylinders at one side of the point where they touch, and is allowed to escape at the other. The steam or other vapour drives a lever or piston attached to the inner cylinder, and so adjusted as to adapt its position in revolving to the varying width of the space between the cylinders, and those to work steam-tight in that space. Where the force of the vapour consists of weight or pressure rather than expansion, the cylinders may be made concentric, and the admission and escape of the vapour arranged “ at such points as will secure the
“ greatest amount of power.” Or the cylinder to which the piston is attached may remain stationary, and power be generated by the revolution of the other cylinders. “ The apparatus above described
“ may also be driven by extraneous power, and used for the purpose of creating a vacuum by the revolution of the lever or
“ piston. It may thus be used as a pump or gas exhauster, or for
“ any similar purpose in which a vacuum is required.”

[Printed, 4d. No Drawings.]

A.D. 1860, February 2.—N^o 277.

TOOTH, WILLIAM HENRY.—“ Improved machinery or apparatus to be employed in the manufacture, melting, or refining
“ of iron and steel, and in the manufacture of puddled steel and
“ wrought iron.”

The raw material is placed in a horizontal rotating cylinder, into which the flame and combustible gases from a furnace or gas generator are conducted, and where they act upon such materials, the latter rolling over and over as the cylinder rotates. On passing out of the opposite end they are carried off by a flue or chimney. Either the furnace and gas generator or the rotating cylinder must be made moveable for repairs. The moveable furnace or fire-place is adapted to the rotating chamber so as to admit atmospheric air, when required, all round the joint between the moveable fire-place and the rotating cylinder, to promote the combustion of the combustible gases directed into the rotating cylinder. The part of the flue nearest the exit aperture is sometimes provided with a moveable cap or cover for the convenience of charging and discharging the rotating cylinder. The rotating cylinder is of iron, lined with fire-stone or other composition that will vitrify or glaze by the application of heat, and thus resist the action of molten metal. It is mounted on anti-friction rollers. "Instead of a furnace or fire-place of the ordinary construction, . . . I sometimes propose to make use of a gas-generating furnace, to which a blast may be adapted for blowing the gases therefrom into the rotating cylinder. By this means I am enabled to regulate the quality and quantity of the gases employed, and the intensity of the blast, and thus have the operation in the rotating cylinder entirely under control."

[Printed, 3s. Drawings.]

A.D. 1860, February 4.—N^o 301.

LAUNAY, CHARLES THEODULE, and DE VERNEZ, AUGUSTE MARIE ALEXANDRE DOMINÉ.—"An improved valve or cock for regulating or stopping the passage of gas, steam, water, or other fluids."

The improved plug is constructed to prevent the escape of any fluid between the plug and the seat or barrel of the valve. For this purpose the upper surfaces of the seat and of the plug are provided with circular grooves concentric with the plug's axis. The outside of the top of the seat has a screw cut on it to receive a hollow cup, india-rubber or other elastic material being interposed between the cup and the seat of the plug. The lower end of the cock may be similarly provided, or the lower end of the

by hastening the distillation of the one and retarding that of the other. 2. "For this purpose I make use of an apparatus which, placed in the peat-distilling retort, retards the distillation of the carburets of hydrogen intended to enrich the peat gas. This apparatus consists simply of a metallic or ceramic case for containing the tar, and which is pierced at bottom only with a certain number of holes, which while distilling allows a required and variable quantity of the gas produced to pass. There will be thus developed a pressure in the interior which will retard the distillation. The other apparatus consists of a furnace furnished with a certain number of retorts, which divert the gas they produce into a central elliptical retort, in which the complete combination of the gases, possessing but little or no lighting power, is effected with gas highly carbonated, in order to furnish a rich and effective gas, which may pass thence to the gasometer."

[Printed, 6d. Drawing.]

A.D. 1860, February 18.—N° 451.

HENRY, MICHAEL. — (*A communication from Louis Cyrille Bureau.*)—"Improvements in the production of gas for lighting and heating, and in apparatus employed therein."

According to this invention, gas for lighting is produced by injecting steam into incandescent fuel. The invention is carried out by an improvement on No. 1174, A.D. 1859, the furnace as improved being employed for the production of gas for heating or lighting separately or simultaneously. Arrangements are adopted for admitting atmospheric air through horizontal tubes into a closed chamber or space below the fire-bars, so as to distribute the draught in a uniform manner beneath the fire. It is also proposed to apply the method of injection, in which air is forced in by means of a steam jet blown into the mouth of a pipe provided with bell or funnel mouths or conical surfaces arranged in a conveying direction, whereby the resisting air is displaced and a vacuum produced, so that the air behind is sucked in and enters the bell mouth, the combined air and steam in turn producing another current, and drawing in the air through an inner cone, by which means a strong inflowing current is obtained.

[Printed, 8d. Drawing.]

A.D. 1860, February 27.—N° 539.

BASSETT, JOHN ALLEN. — (*Provisional protection only.*) —
“Improvements in apparatus for decomposing steam.”

The object is to obtain hydrogen abundantly from the decomposition of superheated steam, and steam under high pressure. The steam is made to enter a retort, filled with coke or other suitable material, through a perforated metallic pipe, which traverses the long axis of the cylinder, the perforations being such as to provide a fine stream of steam. “The relative size of the steam pipe to the interior of the retort may be as $\frac{1}{3}$ or $\frac{1}{10}$ more or less.”

[Printed, 4d. No Drawings.]

A.D. 1860, February 27.—N° 541.

BASSETT, JOHN ALLEN. — (*Provisional protection only.*) —
“Improvements in the manufacture of gas for illuminating and other purposes.”

This invention consists in passing steam into a retort or vessel containing coke or suitable material in a highly heated state, and also through heated pipes. This treatment decomposes the steam, and converts it into an inflammable gas. This gas, after passing through a cooler, where any undecomposed steam is condensed, is caused to bubble through a liquid and volatile hydrocarbon, and is then again caused to pass through a highly-heated retort, by which treatment the mixture of gas with the vapour of the hydrocarbon, which it takes up in passing through it, is converted into permanent gas of great illuminating power.

[Printed 4d. No Drawings.]

A.D. 1860, February 28.—N° 549.

MANSON, MAGNUS. — “Improvements in gas-meters.”

1. The chamber containing the measuring drum is enlarged sufficiently to contain the float, the spindle of which is inclined, its lower extremity being connected with one end of a bent lever of the second order, which is centred on a stud projecting from the face of the meter casing. This bent lever extends out from the main chamber of the meter under a vertical partition, and into the front box, in which the inlet valve is fitted, the spindle of the valve being connected to the lever near its centre.

If the water in the three compartments is at such a level that the valve just shuts, no gas will enter; but on one or more burners being lighted, the water in the meter chamber rises on account of the escape of a portion of the confined gas, causing a corresponding elevation of the float, which opens the valve, and allows the gas from the main to enter, the influx of gas depressing the water in the front box. 2. The inlet valve and the overflow pipe of ordinary meters are arranged in a compartment apart from the other chambers of the meter, so as to make them equal in their performance to (1.) 3. Compensating meter: on the spindle of the measuring drum is a segmental wheel gearing alternately with a double rack, the stem of which is carried upwards and centred on a stud. On the stem of the rack are two pins projecting from the face, and between them is pendent the free end of a reciprocating bar, which is centred on a stud fixed in the bent lever connected with the float. The upper end of the bar is furnished with two pawls taking into ratchet wheels geared together above them. On the spindle of one of these wheels is a pinion or endless screw to convey the motion to the index above for showing the consumption of gas. "The evaporation of the water increases the capacity of the measuring portion of the cylinder, but as the water decreases the fall of the float carries down the vibrating bar, which causes the upper part to vibrate through a larger arc, so that the pawls move a greater number of teeth of the ratchet wheels. In this manner, as the measuring portion of the cylinder becomes enlarged, the index is moved in a corresponding ratio."

[Printed, 10d. Drawings.]

A.D. 1860, March 1.—N° 579.

JOHNSON, JOHN HENRY. — (*A communication from Adolphe Christophe.*)—(*Provisional protection only.*)—"Improvements in gas regulators or governors."

The object of this invention is to regulate the pressure of gas before entering the service mains; it consists in the combination of two apparatus, one a conical valve, fitted inside the principal main at the works, and capable of closing or partly closing the orifice through which the gas passes according to the pressure of such gas. This orifice communicates with a chamber in connection with the main, and by means of a pipe of smaller diameter

than the valvular orifice with an inverted vessel or bell contained in a reservoir of water, the latter being suspended by a chain and counterweighted according to the pressure of gas required in the surface mains. A chain or rod connected to the roof of the bell passes down the pipe which conducts the gas thereto, and is attached at its other end to the conical valve; the raising of the bell will thus, by elevating the valve, contract more or less the orifice through which the gas has to pass before reaching the bell. On the bell being filled with gas, the latter passes off through a second passage leading to the service mains, but, of course, at a certain regulated pressure determined by the counterbalance weights.

[Printed, 4d. No Drawings.]

A.D. 1860, March 7.—N° 619.

WALCOTT, GEORGE.—“An improved receptacle or receptacles “for generating gas.”

1. Economizing fuel by placing the flue or flues through the material to be operated upon, “by which means the fire heretofore “lost by the reverse side of flues and the covering brick arches “of retort beds not coming into contact with the parts required “to be heated is beneficially used.” The flues may be carried on from one retort to another. 2. Arrangement for more effectually loosening and destroying the incrustation on the inner surface of the vessels used for generating gas, by having a vent opening or openings with draft pipes in such part or parts of the said vessel as will admit a current of air to pass through the same when required on the lids being removed, the draught pipes being connected with a flue going to the chimney shaft.

[Printed, 16d. Drawing.]

A.D. 1860, March 8.—N° 635.

SHEARMAN, GEORGE.—“Improvements in water gas-meters.”

1. The float is controlled to act in a separate compartment of the front chamber, formed by partitions dipping to below the water line of such chamber. An opening is formed in the upper part of this compartment for the passage of air, and the gas is excluded from this compartment except when from any cause the level of the water falls below its lower edges. The float is con-

gives the edge of the cover. "The cover is thus conveniently removed and replaced, and the joint is always good."

[Printed, 10d. Drawing.]

A.D. 1860, March 23.—No 760.

WIS, WILLIAM STUMP.—(*A communication from Professor Wis.*)—"Improvements in the manufacture of illuminating gas."

This invention consists in passing the vapour of water and hydrogen or its equivalent through a retort containing red-hot carbon, keeping the retort at a high red heat. In carrying out the invention a boiler is used with two funnels, which conduct the water and hydrocarbon or hydrocarbonaceous matter (such as coal tar spirits of turpentine or benzole) into the boiler. Heat is applied to the boiler, and the mixed vapour of the water and carbon are conducted off through a tube into the retort. The hydrocarbon may be vaporized in a separate vessel, and the vapours mixed with the vapour given off by the water at any point between the vessels which contain them and the retort, or in the retort. "Any hydrocarbon or its equivalent will answer for mixing with the water vapour, but it is preferred to employ those existing in large quantity, as coal tar, in consequence of their greater cheapness."

[Printed, 6d. Drawing.]

A.D. 1860, March 26.—No 782.

FEN, HENRY.—(*Provisional protection only.*)—"An improved standard gas-meter."

This invention relates—1. To a novel mode of constructing a gas-meter so as to reduce the friction of the drum on its bearings. The drum is made of such a size that one revolution thereof measures one cubic foot of gas, and the drum is surrounded by a circular chamber, which, when the drum is immersed in water, the meter, acts as a float, and by supporting the drum on its bearings from a portion of its dead weight, and enables it to rotate with the least possible pressure of gas passing through the meter. The dial is about 20 inches in diameter, and is divided with three or more concentric rings divided to show the part of an inch.

nected with a valve capable of closing the inlet passage, as also with a conical or other suitable valve adapted to regulate the quantity of gas passing into the measuring compartments of the meter when undue pressure is exerted, "and I also connect the float to another valve capable of closing the passage for the atmosphere to this compartment, when, from undue pressure of gas, the float has a tendency to be raised above a certain height, and I sometimes apply a pipe to such opening. In place of forming a separate compartment . . . in the front chamber for the float, the float may be placed in the case for the measuring drum of the meter, and thence by suitable connections attached to the valves. 2. Arrangement of the parts supporting the measuring drum, such that when the meter is tilted the drum comes forward and closes the passage of the gas through the meter."

[Printed, 1s. 4d. Drawings.]

A.D. 1860, March 21,—N^o 730.

TAYLOR, JOHN INGHAM.—"Improvements in apparatus for the manufacture of gas from oil and oleaginous substances."

The ordinary fire-bars are dispensed with and a close hearth of brick employed to confine the heat. The hearth may be inclined so as to reflect the heat on to the retort. In place of furnace doors is substituted an opening with louvres on swivel centres for regulating the draught and clearing out the furnace. The fuel is supplied to the furnace through a hole at top closed by a cover. The retort is made with one or more flat sides, so that when one is worn by the fire another may be turned to it. The surfaces not used are built in to protect them from the action of the fire. Oil is dropped from one or more syphon tubes side by side. Carbonaceous deposit is collected at the lower side of the retort, and extracted at one end. The retorts are of clay, cast iron, or steel. The gas holder is made with wrought-iron tubes as standards to carry the pulleys for the counterbalance weights, and extra weights are suspended by chains over pulleys within reach of the attendant for the purpose of being lowered on to the top of the gas holder when it is desired to increase the pressure on the main. If fire-bars are used they are made to turn on a swivel for convenience of discharging. The cover of the condenser is jointed with india-rubber or similar substance let into a groove which

receives the edge of the cover. "The cover is thus conveniently removed and replaced, and the joint is always good."

[Printed, 10d. Drawing.]

A.D. 1860, March 23.—N^o 760.

LEWIS, WILLIAM STUMP.—(*A communication from Professor Sanders.*)—"Improvements in the manufacture of illuminating gas."

This invention consists in passing the vapour of water and hydrocarbon or its equivalent through a retort containing red-hot carbon, and keeping the retort at a high red heat. In carrying out the invention a boiler is used with two funnels, which conduct the water and hydrocarbon or hydrocarbonaceous matter (such as coal tar or spirits of turpentine or benzole) into the boiler. Heat is then applied to the boiler, and the mixed vapour of the water and hydrocarbon are conducted off through a tube into the retort. Or the hydrocarbon may be vaporized in a separate vessel, and the vapours mixed with the vapour given off by the water at any point between the vessels which contain them and the retort, or in the retort. "Any hydrocarbon or its equivalent will answer for mixing with the water vapour, but it is preferred to employ those existing in large quantity, as coal tar, in consequence of their greater cheapness."

[Printed, 6d. Drawing.]

A.D. 1860, March 26.—N^o 782.

BOWEN, HENRY.—(*Provisional protection only.*)—"An improved standard gas-meter."

The invention relates—1. To a novel mode of constructing the drum so as to reduce the friction of the drum on its bearings. The drum is made of such a size that one revolution thereof will measure one cubic foot of gas, and the drum is surrounded by a close annular chamber, which, when the drum is immersed in the water of the meter, acts as a float, and by supporting the drum relieves its bearings from a portion of its dead weight, and enables the drum to rotate with the least possible pressure of gas passing through the meter. The dial is about 20 inches in diameter, and is provided with three or more concentric rings divided to show the 1,000th part of an inch.

The circular concentric dial-plate is stationary, and the index arms are mounted on the drum shaft. The arm indicating units or parts of a foot is keyed on to the drum shaft, which also carries a pinion of 10 teeth gearing into an intermediate wheel with 100 teeth. On the spindle of the latter is a pinion of 10 teeth, driving another wheel of 100 feet on a sleeve shaft, through which the drum shaft passes. This sleeve shaft carries a second index arm for indicating the higher numbers on the dial.

[Printed, 4d. No Drawings.]

A.D. 1860, March 30.—N° 821.

RICHARDSON, WILLIAM.—“Improvements in apparatus for
“the production of coal gas.”

The principal feature of the invention is the use of a vertical retort, of iron or clay, with two or more mouth-pieces at one or both ends, so placed as to command the whole range of the retort. To the top and bottom mouth-pieces outlet pipes are connected for conducting the gas as generated to the hydraulic main. The number of the mouth-pieces vary with the size of the retort. The retort being heated the first charge of coal is thrown in at the lower mouth-piece until the opening is banked up, when it is closed by a perforated plate, and further secured by a close lid or stopper in the ordinary way. After about six hours, when the gas from the charge is worked off, the upper mouth-piece is removed, and another charge thrown in on the top of the heated coke, and this is repeated for two or more charges, according to the size of the retort, until it is filled. The residuum of coke is withdrawn by being broken up, and drawn through the lower mouth-piece. If it be desired that a portion shall be left in the oven, as the base for the next charge, it is banked up inside of the lower mouth-piece, and the charge supplied through that next above it. By this means a greater quantity of non-condensable gas is obtained by reason of the crude gas being compelled, as it rises from the coal, to circulate through the heated medium of the retort, and then descending through the heated coke of the former charge to escape from the lower mouth-piece.

[Printed, 10d. Drawing.]

A.D. 1860, March 31.—N° 838.

JONES, HENRY, and JONES, JOHN.—“Improvements in wet
“gas-meters.”

This invention consists—1. In doing away with the ordinary direct communication between the water in the body of the meter and that in the rectangular chamber containing the float, and in placing the aperture for the admission of water from the body to the chamber at or above the level of the water-line, thus maintaining the float at a uniform height while the meter is in action, and preventing any improper closing of the gas inlet valve from excess of pressure. 2. In leading the overflow pipe to the back of the meter, where it opens into the back strap at a level a little below that of its front end, and in conducting the water from the back strap to the waste water box in front of the meter, which is furnished with a screwed plug, as usual.

Another mode of preventing fraudulent tilting of the meter is the following :—

“Instead of leading the overflow pipe to the back of the meter, we allow the overflow water to pass directly down into the waste water box, and apply a suspended valve to the aperture, which admits water from the body of the meter to the rectangular chamber in such manner that while the meter remains upright the said aperture remains open, but on the meter being tilted, the valve will instantly close it. 3. In placing the drum in the body of the meter in a position the reverse of that ordinarily adopted, that is to say, placing the uncovered end in front, and the covered end at the back, allowing the gas to enter the uncovered end of the drum directly, and leading it out from the drum into the exit chamber by means of a bent tube.”

[Printed, 6d. Drawing.]

A.D. 1860, April 7.—No 879.

CARTER, HENRY.—“Improvements in machinery or apparatus for making gas-burners.”

The invention relates to machinery consisting of a wheel having bearers for hollow spindles, which hold the rods of metal from which the burners are made, “which box has hitherto been made stationary, and consists in having a double set of drills, and causing the wheel box to move to and fro in suitable guides, so the spindles and rods may be shifted from the first drill to a second one for the purpose of forking previous to the burners being cut off, thus performing the operations of turning,

"drilling, and forking in one machine." The wheel box is moved by means of a treadle on each side of the machine, one being used to bring the metal rods to the forking tools, and the other to return them to their previous position.

[Printed, 4d. No Drawings.]

A.D. 1860, April 13.—N° 927.

CROSSLEY, JAMES WILLIAM, and CROSSLEY, JOHN.—
"Improvements in the construction of singe plates, which
"improvements are also applicable to gas and other retorts."

To remedy the cracking of solid metal singe plates from the unequal contraction and expansion of the metal, such plates are made hollow or cellular, or with flues or passages communicating with each other, and the products of combustion from the furnace are caused to circulate therein. These flues are so arranged as to conduct the flame or products of combustion first through the cells, flues, or passages in the edges, and, lastly, through those in the centre of the plate. "This cellular system of construction
"may also be applied to gas retorts and retorts employed in the
"manufacture of chemicals, whereby a more equable temperature
"may be obtained, and an economy of fuel, by an increase of
"heating surface, or by an extension of application of products
"of combustion."

[Printed, 4d. No Drawings.]

A.D. 1860, April 20.—N° 987.

KINGSTON, WILLIAM HOLLAND.—(*A communication from Aimé Bertholon.*)—(*Provisional protection only.*)—"A coke furnace for the distillation of coals."

1. The improved oven is so arranged that the flame produced in the furnace rises into a straight inclined flue, and then at the bottom of the oven divides into two branches, right and left. Each of the latter pass into semicircular flues "built in the manner of
"a labyrinth," and finally descend into an underground flue, the orifice of which is at the centre of the circumference of the oven. The two columns of flame thus heat on their passage the sole on which the coal lies, exposing it in its entire extent to the action of heat, and are then converted into one column of smoke, which passes into the chambers, where it leaves solid particles in the shape of smoke or coal black. 2. Distilling apparatus. A number of

coke ovens are set in a line, and to their orifices are applied cast iron pipes, having a cap or dome into which the substances, developed by coking enter, and are conducted into a large main pipe. At the end of the main pipe is a tap to regulate the draught, and next to it "a running hole which opens into a suitable vessel for receiving the products resulting from the first condensation by the action of the cold air. The main pipe then is connected with a coil immersed in a tub of water, by which means another condensation is obtained and coal tar produced, which is purer and less hydrated than that obtained by the first condensation. On leaving this tub the pipe assumes a less diameter and forms another coil, which is likewise immersed in water. The third condensation thus obtained produces gases in the first instance which escape through a piece of pipe placed at the top part of the tube, or rather at a higher level and in the second instance oils of essence, which fall to the lower part of the tub."

[Printed, 4d. No Drawings.]

A.D. 1860, April 20.—N° 988.

SEBILLE, CHARLES FELIX.—"A non-metallic composition to be used in the manufacture of water, gas, and other pipes, and machinery or apparatus to be used in such manufacture."

The basis of the composition is pulverized white slate, and in countries where slate is not readily obtainable, pulverized sandstone, ground scoria, powdered sand, or coal cinders. The following are the proportions:—Pulverized slate 70 to 80 parts, resin or vegetable pitch or tar rectified, *i.e.*, freed from essential oil, 20 to 30 parts, and 1 part of dissolved india-rubber; or 25 parts resin, 74 pulverized slate, 1 pigs' bristles; or, again, 24 parts pitch, tar, or resin, 37 pulverized sand, 32 pulverized slate, 5 of sulphur, and 2 of animal or vegetable hair or fibre. The composition is triturated in a crucible at a gentle heat; it is run into a metallic mould also slightly heated; it is strongly pressed by hydraulic pressure in this mould, the annular space between the mould and the mandrel determining the thickness of the pipe or tube. The final operation consists in coating them with a composition of lime. When the pipe is to have a socket at one end for the insertion of the next pipe, it is obtained by moulding the same piece, and a screw thread may also be moulded if desired.

[Printed, 1s. 8d. Drawings.]

A.D. 1860, April 21.—N° 999.

HEDLEY, TOM ABERCROMBIE, and HEDLEY, GEORGE HENRY CARNE.—“Improvements in valves and apparatus for regulating the flow of fluids.”

“Our improvements consist in a peculiar arrangement of cells or compartments, and in the use of plugs, for the purpose of directing the flow of gas from the main leading from the retorts to any purifier or purifiers and thence to the gas holder, or, if required, direct from such main to said holder. The cells (or compartments are formed of one box (cast iron by preference), and consist of one compartment for the admission of gas from the retorts. A number of other cells (corresponding with the number of purifiers used) range contiguous to this, and have direct communication with it by means of plugs or valves. Each of these cells communicate with two purifiers by means of an inlet and an outlet pipe opened and closed by valves; they communicate also with the outlet cell or pipe which conveys the gas to the holder. The inlets and outlets are closed and opened for the passage of gas by plugs ground to fit the openings accurately. . . . They may be worked by handles projecting through the casing, either drawing them up or pressing them down, and either completely opening the aperture or only partially doing so according to the quantity of fluid required to pass. The pressure on the draught of the plugs may be effected by the screwed shank of the handles working in a corresponding screw in the casing.” The gas can thus be directed at once from the retort main cell to any one of the divisions or cells communicating with any two of the purifiers, and, if need be, the flow may be again directed from these divisions to the holder without passing through the said purifiers.

[Printed, 1s. Drawings.]

A.D. 1860, April 24.—N° 1023.

WRIGHTSON, FRANCIS.—(*Provisional protection only.*)—“Improvements in applying certain waste or refuse products to the purification of coal gas, and in utilizing compounds obtained in purifying coal gas.”

1. Coal gas is purified by such sewage of towns as contain sulphuret of iron in addition to organic matter. The sewage is dried and treated with mineral acids, whereby the sulphuret of

iron is converted into salts suitable for the purification of coal gas from ammonia and sulpho-cyanogen compounds. 2. Applying the salt of "pickle waste" (the acid liquid which has been employed in cleaning iron), obtained by evaporation, to the same purpose. The pickle waste contains supersalt of iron and free acid. 3. Utilizing compounds obtained in purifying gas. "I distil sulphur from the residual product obtained in the said purification, called ochre waste, sulphur waste, or spent oxide. I afterwards treat the residuum with mineral acid, and obtain thereby salts of iron, which are suitable for the purification of coal gas from ammonia and sulpho-cyanogen compounds. After use, the ammonical salts are extracted by means of water, and the residuum is boiled with milk of lime, peroxide of iron in the hydrated state is thereby obtained, which may be applied afresh for purifying coal gas from sulphur. In each case the salts of iron are mixed with some porous organic substances, such as sawdust or shoddy."

[Printed, 4d. No Drawings.]

A.D. 1860, April 28.—N^o 1077.

DOWIE, ANDREW LINMERE.—(*Provisional protection only.*)—"Improvements in gas-burners, and in pressure regulating apparatus for the same."

The top of the burner is bell-shaped or rounded off with a pretty broad flange all round. Through this flange inclined holes are bored up from beneath in such a way as to conduct jets of air diagonally into and across the gas flame, thus keeping up an efficient supply of atmospheric air. Or the top of the burner is formed by two fine saw cuts, so as to present two diagonal thoroughfares, and thus produce inclined sheets of flame. The flange is perforated as in the former case. Arrangement of sockets or holders for gas-burners: These are cast in two sections and screwed together. The lower section fits into the gas-pipe, the lower end having three or more angular faces, there being in each an inclined hole, so that the gas is diffused in the interior of a conical chamber, which forms the upper part of this lower tubular piece. The upper section of the socket has a cylindrical chamber at the parts where it screws on to the top of the lower section, and at the top of this cylindrical portion is a

narrow passage into the interior of a spherical chamber, on the top of which is the socket. The upper portion of the bore of this cylindrical chamber is conical, and has in it a perforated disc of pasteboard or other vegetable substance, and beneath this a disc of thin cloth or other animal material. The entering gas is diffused between the discs, and then escapes through the narrow passage into the interior of the spherical chamber, whence it passes to the burner.

[Printed, 4d. No Drawings.]

A.D. 1860, April 30.—N° 1087.

GILLARD, JOSEPH PIERRE.—(*Provisional protection only.*)—
“Improvements in apparatus for manufacturing gas for lighting
“and heating, and for obtaining motive power.”

This invention consists in decomposing superheated steam by injecting it in numerous jets on to a layer of wood, charcoal, or other substance containing carbon free from sulphur, placed in a retort of a peculiar construction, composed of a graphite metal or other impermeable material, lined inside and out with a coating of fire-clay. The steam, after passing through numerous passages in a block of cast-iron red hot, passes to a tube provided with rose jets in fire-clay, through which it acts on the charcoal in the retorts. The gas evolved passes into a purifier, so constructed that the gas rises through the lime or other purifying agent in place of descending through it. The gasometer is weighted with water in place of the ordinary weights. Compressed gas is used as a motive power; the compressing apparatus consisting of a cylinder, to one end of which a flexible tube of caoutchouc is secured. The other end of the tube is secured to a disc or piston working loosely up and down the cylinder, and actuated by a crank and connecting rod. The compressed gas may be used as a motive power, and afterwards as a heating or lighting power. When used for lighting, the wick is of pure platinum or of silicate of magnesia, or of lime, in combination with a rotatory reflector and “a peculiar construction of Argand burner, whereby
“the supply of air is regulated according to the number of jets,
“the jet holes being made in a plate of aluminium or pure
“platinum, whereby oxydation is prevented.”

[Printed, 4d. No Drawings.]

A.D. 1860, May 1.—N° 1094.

UPWARD, ALFRED.—“Improvements in apparatus employed
“ in boring and tapping gas and water mains, and in fitting
“ service pipes thereto.”

The boring is effected by a boring bit at the end of a bar used as a drill. Immediately above it is a cylindrical stem of the size of the bit, which as soon as the bit enters the main passes into the hole and plugs it. Above this is a cutter of larger size turned by the ratchet brace and forced forward by the screw, enlarging the hole sufficiently to receive the tap, which is also formed on the same bar. The burr which has to be removed before the tap can be employed, is cut away by raising the cutter to the top of the burr and turning a cylinder, through which the tap passes. In boring a gas main a tight joint is made with grease between the lower end of the cylinder and the surface of the gas main. A stuffing box at the upper end of the cylinder prevents escape between it and the bar. When the burr is removed a cylindrical part of the bar above the cutter enters the hole and plugs it. “Then the ratchet brace being removed, a spanner may be placed
“ on the bar, and the tap worked by it in the usual manner.
“ When the tap is removed the service pipe is screwed into the
“ hole, and (when applying a service pipe to a gas main) I employ, in order to stop the service pipe and prevent the passage
“ of gas till the fittings are complete, a thin plug or wafer of wax,
“ or other matter readily removed by heat, or a solvent run into
“ the pipe when it is desired to remove the plug or wafer.”

[Printed, ed. Drawing.]

A.D. 1860, May 7.—N° 1133.

HARRIS, JOSIAH.—(*Provisional protection only.*)—“Improvements in the manufacture of coke and charcoal from lignite,
“ and obtaining products therefrom.”

The lignite is placed in a close kiln having feed and discharge holes and pipes to convey gas or air to or from it. The gaseous products, when conveyed into suitable receivers, can be used for heating, lighting, exhausting, or other purposes. After the gases have been withdrawn the dampers can be shut down to prevent the admittance of atmospheric air. “The air or gases remaining

" in the kiln, furnace, or receptacle are exhausted by being drawn out or consumed. The fire in the coke or charcoal is put out by water, steam, or carbonic acid gas, either used separate or in combination, the residue being coke or charcoal."

[Printed, 4d. No Drawings.]

A.D. 1860, May 9.—N° 1142.

KEMP, HENRY.—"Improvements in preserving wood, leather, iron, and other substances."

This invention consists in the application of peat, tar, and peat oil and wood tar mixed with sulphuric acid, methylated spirits, vegetable naphtha, arsenic, sulphate of iron, rosin, carburet of iron, and oil, or any one or more of them, to the preservation of the gas pipes and other articles. In operating on wood or other porous material the air is withdrawn by any ordinary means, and the preserving materials admitted in a heated state, after which they are submitted "to a pressure equal to one or more atmospheres by any ordinary means." The process is then complete and the articles are withdrawn and allowed to dry. Wood is, before being submitted to this operation, punctured with numerous small holes, in order that the preserving materials may penetrate the more easily. The materials are applied to iron in a heated state, one coat being allowed to set before a second is applied.

[Printed, 4d. No Drawings.]

A.D. 1860, May 12.—N° 1177.

SENIOR, WILLIAM, and STATTER, WILLIAM.—(*Provisional protection only.*)—"Improvements in purifying gas, and thereby obtaining a useful product."

"Our said invention consists of the application of the fibres of cocoa-nuts, flax, hemp, and several other vegetable fibres in the purification of gas from ammonia, which fibres we have discovered possess the property of absorbing ammonia as the gas passes through or amongst them. The fibres will absorb ammonia from gas even when in a dry or comparatively dry state, but they act more efficiently when moistened with water."

[Printed, 4d. No Drawings.]

A.D. 1860, May 16.—N° 1207.

NEWTON, ALFRED VINCENT. — (*A communication from the "Société Parisienne pour l'Eclairage au Gaz."*)—"An improved mode of treating oils for the production of gas and volatile oils."

This invention has for its object the application of heavy oils to the production of gas, and of light or volatile oils or essences, such as benzole. The apparatus consists of a retort with openings diametrically opposite to each other at its extremities, one opening serving for the introduction of the oil, and the other for the escape of tar and gas, which pass down through a pipe into a water chamber below the retort. From this apparatus the gas passes into refrigerators, similar to those employed for coal gas.

[Printed, 8d. Drawing.]

A.D. 1860, May 21.—N° 1242.

COPCUTT, JAMES. — "Improvements in manufacturing gas and carbon or lampblack in one or the same apparatus, and in the apparatus employed therein, and for means and apparatus for rendering the gas applicable for lighting of ships, light-houses, mines, and all other places where gas can be used."

The first of these objects is attained by distilling at a red heat the common vegetable pine, resin, or other oils, or coals, resin, grease, tar, or other bituminous or highly carbonaceous substances, either or any of which substances may be introduced separately or in a combined state in one or the same retort."

By making the retort double a passage is left between the inlet and outlet for hot air, so as to maintain the necessary temperature, and so cause the vapour to be formed before arriving at the outlet. Before arriving at the outlet pipe the gas is made to traverse backwards and forwards over the lengthened heated passage, and therein deposit a rich carbon or lampblack. For ships, light-houses, mines, &c., where space is an object, the retort is made with a horizontal or vertical division half an inch thick at the middle part, and increasing progressively to about three inches at the side, thus acting as a conductor of the necessary degree of heat to the middle thereof. Oil, resin, grease, and tar enters the retort through a syphon. After leaving the retort the gas is made to dip into and near the bottom of a vessel containing oil or tar or

other fluid. Passing thence, it enters a chamber above the cooling vessel filled with wool or hair to clear the gas, and thence into a third chamber containing lime or other suitable purifying matter. The gas is compressed for use in mines, powder magazines, and other dangerous places, in which moreover the flame is enclosed within a fine wire gauze safety screen. The burner is surmounted by a platinum or other deflecting disc placed in the centre to conduct or drive the air into contact with the interior of the flame. The flow of gas is equalized by a box with an elastic top, which is raised by the gas, and thus works a stud which presses against the inlet hole.

[Printed, 6d. Drawing.]

A.D. 1860, May 26.—N^o 1301.

HUGHES, EDWARD THOMAS.—(*A communication from Gustav Arnold Kühne.*)—"Improved methods of obtaining artificial light, " and in the apparatus and burners connected therewith."

This invention consists in apparatus for the consumption of hydrogen gas produced by the decomposition of steam, &c. The gas is supplied by a pipe to the lower end of a tube, above which is a ring connected to the tube by plates or wires. This tube is surrounded by a second, and in the space between them, which is closed at bottom, is placed an ordinary cotton wick or mesh moveable up and down as required. "The said tubes are passed " through a reservoir containing turpentine or ordinary fine " oil, or other carbonaceous matter, which circulates through one " or more holes to the wick or mesh, by which the said carbonaceous matter is absorbed, and after the absorption has taken " place a third tube is . . . fixed on to the top of the second tube, " which third tube is terminated by the ordinary or any suitable " gas burner. If the hydrogen gas is now turned on so as to " flow through the inner tube, and then ignited at the burner, the " second and third tubes will become heated and produce carburetted gas by the evaporation of the oil or other carbonaceous " matter absorbed in the wick or mesh, which gas is incorporated " with the hydrogen gas, and flowing through the burner feeds the " flame, and produces a light of much greater intensity than has " hitherto been obtained from any carburetted hydrogen gas."

[Printed, 6d. Drawing.]

A.D. 1860, May 31.—N° 1337.

BOWDITCH, WILLIAM RENWICK.—"Improvements in the
" purification of coal gas and of coal oils."

" Pulverized clay slightly damp is placed in the ordinary dry
" lime purifiers of gas-works, and the gas is passed through layers
" of the said clay in addition to being passed through layers of
" slaked lime or hydrated metallic oxides, or salts, or acids used
" in the ordinary and known methods of purification of gas."
The use of the clay as " supplementary to the other materials " is
the object of the Patent. In carrying out the invention " purifiers
" containing clay alternated with the other materials are to be
" used at the gas-works, and a smaller one may be employed on
" the premises of the consumers of gas to remove impurities
" which have escaped purification at the gasworks. The foul clay,
" when no longer fit for use in the purification of gas, is em-
" ployed as manure. I also pass gas through clay, slaked lime, or
" hydrated oxide of iron heated below redness, and subsequently
" through purifiers containing the ordinary cold materials
" employed in the purification of gas to remove impurities not
" removable by processes at present in use. I also pass oils
" obtained by the distillation of coal or coal tar through vessels
" filled with heated purifying materials as is above specified for
" purifying gas."

[Printed, 4d. No Drawings.]

A.D. 1860, May 31.—N° 1343.

MANNING, JAMES ALEXANDER.—"Improvements in the
" treatment, application, and use of sewerage matters, and the
" general waste of towns and factories."

This invention consists of improvements on No. 1786, A.D. 1855,
No. 1579, A.D. 1856, and No. 179, A.D. 1858. The only portion of
the Specification referring to the present series is application and
use of the combustible gases obtained from the refuse matters for
the purposes of illumination and heating. To obtain ammoniacal
liquor the destructive distillation of faecal matter and refuse is
effected in a retort of peculiar construction. "The water of
" condensation or solution containing the soluble matters is sub-

“sequently evaporated or otherwise treated for the purpose of obtaining the valuable salts therefrom. The ammonia, which is evolved from the materials in the retorts, is absorbed by the water in the refrigerator, and this ammoniacal liquor is converted by the ordinary chemical process into sulphate of ammonia. If however it is found that the gaseous products evolved from the refuse materials in the retorts contain a sufficient amount of hydrogen and carbon, these gases may be judiciously applied to the illuminating of the manure works or other generally similar purposes.”

[Printed, 6d. No Drawings.]

A.D. 1860, June 1.—N° 1353.

NEWTON, WILLIAM EDWARD.—(*A communication from George Washington Crummy.*)—(*Provisional protection only.*)—“A new and improved regulator for gas-burners.”

This consists of a valve with an independent weight and stop placed within the burner. The body of the burner fits into a cup-shaped socket attached to the supply pipe, and secures the valve box in its place. The latter forms an inverted cup having the sides of its interior tapered upward slightly in a conical form and terminating in a dome-like top, in the centre of which is an opening, the only means of egress for the gas to the burner. The box is grooved up the interior to afford passage for the gas between it and the valve. The valve is also of an inverted cup form, having its exterior of a shape corresponding with the shape of the interior of the box, and having a short stem which passes through the opening at the top of the box. This stem is provided with a small transverse pin, which rests upon the top of the box and keeps the valve suspended when there is a very slight pressure of gas, or when the gas is shut off from the burner. The weight is formed with grooves to slide up and down in fixed vertical guides which are attached to the top of the valve box and rests upon the top of the valve box, so that when the valve is suspended by its pin the top of its stem may be at a considerable distance from the weight, which is therefore to a certain extent independent of the valve. At the lowest pressure of gas the valve is suspended by its pin from the top of the box. As the pressure

increases, the gas raises the valve, thus contracting the passage between the valve and the head and sides of the box, and on the pressure reaching a certain point the top of the stem of the valve comes in contact with the weight, which is raised and continues to contract the passage until it comes against a stop.

[Printed, 4d. No Drawings.]

A.D. 1860, June 5.—N° 1380.

BOWER, GEORGE.—“Improvements in apparatus for manufacturing, controlling, and regulating the flow of gas.”

This invention consists of a gas generator, an improvement on No. 368, A.D. 1859. An upright cylindrical or slightly conical furnace, lined with fire-brick and furnished with doors one above the other, is placed on a metal frame carrying a set of circular fire-bars. The upper doors are for stoking, the lower for clearing the bars. In the centre of the furnace, and projecting slightly above and below it, is a cylindrical cast-iron retort, the lower end of which is capable of being closed by a disc plate and luted door, opened and shut by a forked lever, for withdrawing the charge from the retort. At the upper end of the retort is a cast-iron chamber closed by a luted plug at the top, with an outlet at one side for the gas passing to the purifier. The lignite, shale, or other solid material is fed through a hopper. Liquid materials are admitted at the bottom of the retort, and the vapours made to pass through incandescent charcoal or coke. 2. Governor for controlling the flow of gas. In the centre of a cylindrical box and cover furnished with an inlet and outlet pipe, a valve of a parabolic form is suspended by a cup-and-ball joint on the lower end of a rod, which works vertically through a brush in the cover. The valve when raised closes the inlet orifice the upper end of the valve rod is attached to one end of a lever terminating in a pointer which traverses between two adjustable stops, by means of which the range of the governor can be regulated to the valve rod. Within the valve box is attached a gas holder working in water. When the gas enters the governor it raises the holder and valve, and would entirely close the valve but that the opposite end of the pointed lever before mentioned is weighted so as to maintain an uniform pressure previously determined upon.

[Printed, 10d. Drawing.]

A.D. 1860, June 7.—N^o 1407.

COOKSON, GEORGE JOHN.—(*A communication from James Gabriel Pavyer.*)—"Improvements in gas regulators."

The case or shell is composed of two hemispherical pieces of metal connected by flanges around them and screws passing through the flanges. A pipe extends from the lower side of the case, and another stands out from the side of the case having its outer end turned up and screwed to receive the burner. Between the flanges of the case is clipped the outer edge of a circular disc of leather, forming an elastic diaphragm held around its centre between two plates, below the lower of which is a nut, and above the upper of which is a nut and a cup for holding weights. The central plates, nuts, and cup are held together by a screwed rod, the lower end of which depends vertically, and has on it a convex valve with its convexity turned upwards. This valve comes against a seat formed within a union screwed upon the pipe at the bottom of the case. On the upper side of the case is a removable cover, with a central aperture for a plug which has a smaller aperture through it. The cover is removed when it is desired to vary the weights in the cup. The gas, after passing through the union and past the convex valve, enters the case below the diaphragm, and when the burners are opened is expelled by the joint action of the weighted diaphragm and its appendages and of the atmospheric pressure exerting itself through the aperture above. When the pressure from the main becomes excessive the convex valve is forced upwards to a greater or less extent, and the supply more or less cut off.

[Printed, 10d. Drawing.]

A.D. 1860, June 8.—N^o 1412.

CROLL, ALEXANDER ANGUS.—"Improvements in the purification of gas."

This invention consists in the use of shale, or spent shale, or other aluminous matters, combined or saturated with sulphuric acid, and placed in dry lime purifiers, in the production of gas. Alum shale roasted, as for the manufacture of alum, is mixed with an equal proportion of sulphuric acid at a temperature of about 200° Fahrenheit. The compound is placed in apparatus "of the character generally known as dry lime purifiers." The

gas is passed through these purifiers until it is found that the material has become spent. The test used is turmeric or reddened litmus paper.

[Printed, 4d. No Drawings.]

A.D. 1860, June 8.—N° 1418.

RICHARDSON, WILLIAM. — (*Provisional protection only.*) —

“ An improved method of joining and fixing together drain-water or gas pipes made of burnt clay or other earthy vegetable or mineral matter, thereby rendering them air and water tight, and preventing leakage.”

This invention consists in placing between the joints a packing of “ felt, cement, or any other material applicable to the purpose,” and securing the flanges together by means of pegs or pins of wood driven through perforations in the flanges.

[Printed, 4d. No Drawings.]

A.D. 1860, June 18.—N° 1480.

KEATES, THOMAS WILLIAM. — “ An improved mode of separating carbonic acid gas from the gaseous products derived from the distillation of peat and other vegetable matter.”

The mixed gases as they pass from the retort are first cooled in the usual way by being passed through some form of condenser, and then conducted to a purifier containing oxide of iron for the purpose of separating therefrom the sulphuretted hydrogen and the sulphides that may be contained therein. The mixed gases thus partially purified are conducted into a vessel containing acetate or other soluble salt of lead, which substance having a strong affinity for carbonic acid absorbs that gas and is converted into carbonate of lead (white lead), leaving the heating or illuminating gas free from carbonic acid.

[Printed, 4d. No Drawings.]

A.D. 1860, June 20.—N° 1489.

KENDALL, WILLIAM, and GENT, GEORGE. — “ Improvements in machinery or apparatus for making gas-burners.”

The rods of metal of which the burners are made, pass through and project from hollow revolving spindles. For drilling the holes and forming the sides of any suitable number of burners at once

operation two slides are employed, the lower one moving parallel with the spindles, and the upper one moving in the same direction and also transversely at the same time. The lower slide has as many vertical projections as there are spindles, the projections holding the drills which make the main holes of the burner while the outer part is being formed by the turning tools. Upon the upper slide are a number of tool holders, one to each spindle, for cutting the burners to their exact diameters, and against the end of the guide is a projecting piece of steel forced against a die or guide made to any pattern to suit the form of burner required. At the back of the die or guide, and parallel with the spindles, is a wedge-like stay with a small lever or handle, by which the wedge-like piece can be withdrawn or pushed forward at pleasure, and the die and upper slide with the tools moved transversely, so as to turn or cut the burners larger or smaller, or separate them entirely from the metal of which they are made.

[Printed, 1s. Drawings.]

A.D. 1860, June 25.—N° 1544.

HIGGINBOTTOM, WILLIAM.—(*Provisional protection only.*)—

“Improvements in pipe joints and valves for gas or water mains
“and sanitary purposes generally.”

This invention relates to a form of joint for earthenware or metal pipes, and to the construction of sluice valves and hydrants in connection therewith; it consists in jointing the ends without the aid of the ordinary socket on the pipe itself by means of a loose socket of metal or earthenware, with a cavity into which a “suitable cement” is heavily pressed, so as when hard to render the joint water-tight. The shells of the valves and hydrants are made of earthenware instead of cast iron, and the valve facings “are fitted into their places by the same process described in reference to the pipe joints, that is to say, by forcing cement “round the valve facings after they have been placed in their “proper positions.”

[Printed, 4d. No Drawings.]

A.D. 1860, June 28.—N° 1563.

BINKS, CHRISTOPHER.—(*Provisional protection only.*)—“Im-
“provements in manufacturing oxygen gas.”

This invention consists "in effecting the decomposition of water free or combined, or in its ordinary form, or in that of steam, under the agency of chlorine mixed with or brought in contact with it under a high temperature, and the conjoint action of any substance or substances capable of retaining or of fixing, by combination or otherwise, the hydrochloric acid, formed by the reactions between the hydrogen of the water and the chlorine, but not capable of retaining or of fixing the oxygen, which is thus set free in its gaseous form."

[Printed, 4d. No Drawings.]

A.D. 1860, June 30.—N° 1586.

LAMING, RICHARD, and SMITH, CHARLES.—"Improvements in purifying certain gases and liquids from sulphuretted hydrogen."

This invention consists :—1. "With respect to oxides of manganese, purifying from sulphuretted hydrogen, first, the gases obtained by distilling coal and similar matters, and, secondly, gas liquors and similar solutions, by the agency of native or artificial oxides of manganese reduced to powder by mechanical means, or of oxides made by heating the artificial carbonate, conjoined with the repeated use of the oxide which is produced in an effective condition by exposing to the air, at atmospheric temperatures or thereabouts, the metallic sulphide which results from each purifying operation." 2. In "the purifications of the same gases by the said mechanically prepared oxides, when it is done simultaneously with the use of oxygen gas or of atmospheric air mixed with the gases preparatory to their purification." 3. "With respect to oxides of iron, purifying from sulphuretted hydrogen the gases obtained by distilling coal and similar matters by means, firstly, of elutriated oxides of iron, in contradistinction to those which are either reduced to the impalpable state by precipitation from solution, or left by the unaided process of grinding in the condition of gross powder, parts of which latter are necessarily too coarse to be very effective, and, secondly, of oxides of iron generally when incorporated mechanically, while in a state of extreme division and in a wet condition in the absence of earthy matter, with dry absorbent materials, whereby their minute parts are prevented injuriously contracting upon one another by age or by becoming dry."

[Printed, 4d. No Drawings.]

A.D. 1860, July 3.—N° 1608.

RICHARDSON, THOMAS.—“Improvements in purifying coal gas.”

This invention consists in employing metallic iron in a fine state of division, moistened with water either alone or mixed with a porous material, lime, magnesia, or the sulphates of those earths in the ordinary gas purifiers. The iron is reduced by turning two cylinders with their cams in contact at a speed of 500 to 1,000 revolutions in a minute, by grinding or by sifting iron filings. “When the iron powder, or any of the above mixtures, has become impaired in its purifying action by the saturation of the iron by sulphur, I submit it to a strong red heat in a close furnace so as to drive off the impurity, and the residue is again fit for further use.”

[Printed, 4d. No Drawings.]

A.D. 1860, July 4.—N° 1617.

STANDLY, HENRY JOHN. — (*Provisional protection only.*)—

“Improvements in the production of gases for illumination and other purposes.”

The improvements “relate particularly to the production of oxygen and nitrogen gases, and consist in the treatment of atmospheric air by the agency of lime and a compound or compounds of stronthia, potassa, and soda, with which it is brought into contact and chemical union by means of heat in a suitable apparatus, whereby I effect the decomposition of the atmospheric air into its constituent elements, oxygen and nitrogen, which I am thus enabled to produce with facility and economy for the purposes of illumination and various chemical processes and manufactures.”

[Printed, 4d. No Drawings.]

A.D. 1860, July 5.—N° 1629.

STANDLY, HENRY JOHN.—(*Provisional protection only.*)—

“Improvements in the production of gases for illumination and other purposes.”

The improvements “relate particularly to the production of oxygen and hydrogen gases, and consist in the treatment of water by the agency of the manganate of potassa and the man-

“ganate of soda by means of heat in a suitable apparatus, whereby I effect the decomposition of the water in which they are dissolved into its constituent elements, oxygen and hydrogen, which I thus obtain with facility and economy for the purpose of illumination and various chemical processes and manufactures.”

[Printed, 4d. No Drawings.]

A.D. 1860, July 6.—N° 1638.

BIEDERMANN, EMIL.—(*Provisional protection only.*)—“Improvements in apparatus for the measurement of gas and other fluids.”

The improvements consist in using two or more inverted cups or bells working in water, oil, mercury, or other fluid, and connected so as to rise and fall as the gas is admitted alternately to one or the other. Attached to the pivot on which they move is a lever, which, acting on an escapement, gives motion to a tube filled with mercury or other heavy fluid, which tube, on being tilted, causes the mercury to fall, and through this lever give motion to a slide valve through which the gas to be measured passes on its way to the cups.

[Printed, 4d. No Drawings.]

A.D. 1860, July 7.—N° 1640.

LESLIE, JOHN.—“Improvements in the manufacture of gas.”

The gas derived from distilling coal, &c., instead of being conducted from the upper part of the retort and thence into the hydraulic main, is caused to descend from the retort at the lower part thereof into a chamber furnished with a syphon for running off the condensed fluid, and thence the gas is led off by a pipe at the upper part of the chamber to purifiers. In purifying gas a solution of salt of copper (sulphate preferred) is employed to saturate wood shavings, sawdust, charcoal, or other porous material through which the gas is caused to pass.

[Printed, 4d. No Drawings.]

A.D. 1860, July 11.—N° 1666.

HALL, WILLIAM KEMBLE.—(*A communication from Calvin T. Herring.*)—“Improvements in gas regulators.”

This invention consists in the application of thin curved metal plates to the flexible diaphragm of a gas regulator, so as to impart to the regulator "the sensibility incident to the application of plates thereto without impairing the extent of its action or its flexibility, as is the case when the plates are made flat and clamped close to the diaphragm." The flexible diaphragm and the curved plates are clamped together, and the plates so arranged that the diaphragm folds or curls between the plates in raising as well as around the outside of them.

[Printed, 6d. Drawing.]

A.D. 1860, July 17.—N^o 1734.

GOULSON, JOH. — "Improvements in gas and other fluid meters."

1. To remedy the defects in the present opaque dials which prevent the wheelwork of the counting apparatus being examined, a transparent dial of pressed glass is used, having the necessary letters and figures on its face. The glass dial serves as a front plate to the index as well as dial plate, and the arbors of the wheels and pinions pass through and take their bearing in holes in the glass dial. 2. To obtain a constant level in wet gas meters an endless chain of cups is employed, passing through a tube and round two rollers, the lower roller being at the bottom of the tube and in the water reservoir. The upper roller is at the top of the tube and in the measuring chamber. The upper roller which moves the chain is driven from the index spindle. The tube is soldered in the partition plate between the measuring compartment and reservoir, and being closed at the lower end by the water serves to prevent gas passing from one compartment to the other. The cups at their highest position discharge their water upon the roller, in which is a groove down which it runs into a spout for its reception into the upper or measuring compartment of the meter.

[Printed, 8d. Drawing.]

A.D. 1860, July 19.—N^o 1752.

STENHOUSE, JOHN.—(*Provisional protection only.*)—"Improvements in purifying coal gas."

The invention consists "in purifying coal gas by sulphuret of carbon by treating the gas with spirits of wine (the ethylic

" alcohol of chemists), or with wood spirit (the methylic alcohol
 " of chemists), or with fusil oil (the amylic alcohol of chemists).
 " I also take solutions of potash, soda, and ammonia, with their
 " sulphurets and carbonates, dissolved in the before-mentioned
 " alcohols. I employ these solutions either singly or in combi-
 " nations. I likewise add to these alcoholic solutions rectified
 " coal tar, naphtha, the oils of coal, tar, and any other suitable
 " liquid, hydrocarbons, or essential and fixed oils. I treat the
 " gas with these liquids by means of the well-known apparatus
 " called a washer, or any other suitable mechanical arrangement.
 " The bisulphuret of carbon is absorbed by these liquids, forming
 " the well-known series of acids, viz., the xanthic, the xantho-
 " methylic, the xanthamylic, and if alkaline bases are present the
 " corresponding salts of these acids, containing potash, soda,
 " and ammonia, are produced. When these carbons have . . .
 " become saturated with bisulphide of carbon they are removed
 " from the apparatus, and by cautious rectification, advantage
 " being taken of the difference in volatility of the alcohols and
 " bisulphuret of carbon, these substances are separated from each
 " other, and thus the greater portion of the spirits and bisulphuret
 " of carbon are recovered. When alkaline solutions are employed
 " it is necessary to neutralize the alkalis with acids before begin-
 " ning to rectify, and in this manner the greatest part of the
 " alkali is also recovered."

[Printed, 4d. No Drawings.]

A.D. 1860, July 21.—N° 1774.

NORMANDY, ALPHONSE RENÉ LE MIRE.—"Improvements
 " in connecting gas and other pipes."

" The pipes to which I apply my improved joint I make plain
 " from end to end, i.e., without sockets, and when two such pipes
 " are laid end to end, I slip over them, to the point where the
 " ends meet or come opposite each other, a short cylinder of
 " slightly larger diameter than the pipes to be connected. This
 " short cylinder is made at its two ends with sockets or recesses
 " of larger diameter than the other parts of the cylinder; it has
 " also flanges at its ends. Into the sockets or recesses rings of
 " vulcanized india-rubber . . . are introduced, and over these
 " filling pieces or rings of metal are placed, which enter the
 " sockets or recesses. These filling pieces are furnished with

" flanges, by means of which the said pieces are forced down upon the packing, screw bolts being employed to draw the flanges on the filling pieces up to the flanges on the cylinder."

[Printed, 6d. Drawing.]

A.D. 1860, July 23.—N^o 1776.

GREEN, HENRY.—"Improvements in charging and drawing the charge from gas retorts, and in the machinery employed in performing such operations."

This invention consists of a mechanical arrangement for charging and discharging retorts. The coal is placed in a scoop above the retort, and is deposited in the same by the tilting of the scoop in the bottom of the retort. The empty scoop is withdrawn by reversing the motion of the screw or other machinery by which it is worked. The coke is withdrawn from the retort by a species of rake or shovel, with the teeth or blade hinged or otherwise connected with the shank, and moved to and fro by a screw or other suitable machinery. "The machinery may be constructed to operate on one or more retorts at the same time, and it may be mounted on a travelling frame which is moved from one retort to the other. It may also be double-acting, i.e., while one part of the machine is charging a retort, the other part is drawing the charge from another retort."

[Printed, 10d. Drawing.]

A.D. 1860, July 24.—N^o 1790.

BRUNNER, WILLIAM, and LEVETT, WILLIAM HALL.—(*Provisional protection only.*)—"An improved apparatus for increasing the illuminating power of coal gas, also for economizing the consumption thereof, and for regulating the pressure from street mains."

Within the case of the apparatus, which may be of any material or shape, divisions or partitions are so placed that the gas which enters the apparatus is compelled to pass through, over, or under, or to enter at either side of the series of partitions. The partitions are of cotton, wool, worsted, or other fibrous and absorbent material, either separate or combined. "It is further proposed to adapt at one or both sides of each of the absorbent partitions a partition of metal, parchment, skin, hide, or other similar substance, perforated so as to diffuse the gas over the absorbent

" partitions. The apparatus thus constructed is to be either
" partially or wholly filled with a spirit or oil known as benzole,
" or naphtha, or a mixture of benzole and naphtha, or any other
" spirit that will increase the illuminating powers of the gas."
The Patentees claim only the apparatus, and not the spirit or oil specified.

[Printed, 4d. No Drawings.]

A.D. 1860, August 3.—N° 1878.

KUKLA, FRANCIS XAVIER.—"An improved self-regulating gas-burner."

The burner is made in two parts screwed together. The lower part has a nipple covered with a loose cap, which rises by the upward pressure of the gas, and acts as a valve for regulating the passage of the same. Over the cap and nipple is screwed the top part of the burner, and the interior of that part of the same surrounding the said cap is made conical, by which means, in proportion as the cap is raised, the annular space round the same is diminished, and the emission of gas from the burner is decreased. Above the conical part of the burner is placed a piece of fine spiral wire, through which the gas passes on its way to the aperture of the burner. Gas-burners thus constructed "will regulate and economize the consumption of gas and effect its thorough combustion."

[Printed, 6d. Drawing.]

A.D. 1860, August 8.—N° 1915.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Pierre Hugon.*)—"Improvements in apparatus for burning gas in carriages, ships, and other moving structures."

This invention "consists in placing between the regulator and the burners a circular or other vessel or holder of a capacity proportioned to the number of burners, whereby the supply to the burners would be maintained should any sudden shock or jerk cause the gas to be momentarily shut off from the store to the regulator." It is immaterial whether the reservoir is placed immediately after the regulators or at any other point between them and the burner.

[Printed, 10d. Drawing.]

A.D. 1860, August 20.—N° 2009.

BRIDGMAN, EDWARD.—“Improvements in the construction of
“ wet gas-meters.”

The inlet tube is fitted with a valve carried by a rock lever, to the inner end of which a float is attached. This float is made saddle-shaped so as to override the horizontal bend of the spout by which water is supplied to the meter. Within this spout, or adjacent thereto, is a small pipe, which gauges the height of the water in the meter, and is so situate as to stand up within the measuring drum midway, or nearly so, between its sides, the object being to get this pipe so near the middle of the meter case that the tipping of the meter in any direction will not materially change the relative positions of the water level and the top of the pipe. The outlet like the inlet tube is fitted with a cut-off valve, carried by a rock-lever, fitted with a saddle float. This float rides over the drum axle, one end of which has its bearing in a cross-piece at the back of the meter, and the other end in a support near the centre of the meter. The drum consists of an inner and outer periphery, the space between them being diagonally partitioned into four measuring chambers, and “closed in by side plates, “overlapping each other as usual. The central space of the “drum is divided by a central vertical division plate, and on “either side of this plate is an opening into each measuring “chamber for the admittance of the gas to be measured, and “its exit when measured. In order effectually to seal these “openings hoods are applied over them, so that the inlet open- “ings in leaving the water remain sealed until the side entrance “to the chamber is also uncovered, and the sealing of the exit “openings in the bottom and side of the measuring chamber “will also by this means take place simultaneously, or nearly “so.”

[Printed, 1s. 4d. Drawings.]

A.D. 1860, August 22.—N° 2018.

WEST, ROBERT.—“Improvements in the construction of wet
“ gas-meters.”

1. “My improvements in the measuring wheel or cylinder
“consist in diminishing the width of the cross-fans at the
“water line, and making the front of the cylinder flat instead

“ of convex, by which means the variation in the registration
“ of wet gas-meters, caused by the variation in the height of
“ the water line from evaporation and other causes, is very
“ much reduced. For a meter for a large number of lights the
“ cylinder is constructed with an internal cylinder with the cross
“ fans diminished in width where they join thereto, but so placed
“ as to form the spaces between the leaves of the cylinder wider
“ at the water line than at the periphery of the cylinder, which
“ arrangement enables the water to escape freely from the gas
“ chambers of the cylinder. There are no openings in the peri-
“ phery of the internal cylinder, and the capacity of the measur-
“ ing wheel or cylinder is the space between its periphery and
“ the periphery of the internal cylinder and the back and front
“ leaves.” 2. “ My improvements in the valve and float consist
“ in attaching to the valve box a screw with one or two nuts,
“ which screw is passed through the side or top of the front box.
“ If the screw is passed through the side of the box the tube is
“ lengthened so as to allow the valve to be adjusted and after-
“ wards secured by the outside nut, if through the top two nuts
“ are required, one inside and the other outside. The relative
“ positions of the valve and float are also regulated by a screw
“ on the valve rod, working in a nut secured at the top of a tube,
“ which passes through the float, there being in addition a lock
“ nut to keep the parts firm after the adjustment.”

[Printed, 10d. Drawing.]

A.D. 1860, August 24.—N° 2038.

HALTER, ANTOINE, and DECORCE, FRANÇOISE (Widow Douard).—“ Improvements in the manufacture of flexible tubes
“ for the conveyance of water, illuminating gas, or other fluids.”

The bore of the tubes is formed of iron or copper wire, covered with several folds of cloth, and coated with liquid india-rubber. The metallic bore is made by rolling the wire in helixes, more or less apart, upon a cylindrical mandril. This metal skeleton is then enveloped in the folds of cloth. In some cases a roll of india-rubber is added, so as to render them perfectly impervious. When likely to be exposed to friction a second coil of wire is wound round the outer covering, and covered as before described.

[Printed, 8d. Drawing.]

A.D. 1860, August 27.—N° 2070.

MATHER, COLIN.—“Improvements in gas singeing apparatus.”

The fabric is led into an oblong chamber divided by a hollow partition, so that after entering the lower part of the chamber it passes against the curved lower edds of the partition. It is conducted into and out of the oblong chamber by guide and supporting rollers. It may be made to enter the chamber from the upper part, and thence pass downwards under the ends of the partition (the arrangement preferred), or from the lower part, whence it will pass more directly under the ends of the plates of the partition. Doors are suitably arranged to give access to the interior of the chamber. A gas apparatus is used in combination with the chamber, “by which gas and atmospheric air are supplied in a manner which is well understood when used for other purposes, in order that the gas may be largely mixed with the air before the same is ignited. By these arrangements there will be no fan or other artificial means of obtaining draft required, the products of combustion and dust will be carried away by the draft of the chimney, and by reason of burning large quantities of atmospheric air with the gas, and the consequent perfect combustion of the gas, no black or coloured marks will take place on the cloth or fabric singed by the apparatus.”

[Printed, 10d. Drawing.]

A.D. 1860, August 28.—N° 2074.

SIEMENS, CHARLES WILLIAM.—“Improvements in engines to be worked by the alternate expansion and contraction of steam and other elastic fluids.”

This invention consists of improvements on No. 326, A.D. 1852, and No. 1363, A.D. 1856. The third or charging cylinder is suppressed and two working cylinders added, the latter being attached with their working pistons to two points of the oscillating disc at right angles with those of the two other working cylinders. The four working cylinders are closed in front, and communications are established from the front end of the first to the heated or back end of the second through a generator or respirator; from the front of the second to the back of the third; from the front of the third to the back of the fourth; and from the front of the fourth to the back of the first, thus completing the circle. Each cylinder thus answers

the purpose of charging cylinder to the next. "When gases are used as the working medium, and internal firing is resorted to, I attach an open tube or chamber to the hot end of each working cylinder, which tube or chamber having recesses presenting highly-heated surfaces, may be lined with or consist of platinum or other refractory material. Two branch pipes leading into this chamber supply at the proper moment the one a current of inflammable gas or liquid convertible into gas by the heat of the chamber, and the other a current of oxygen or atmospheric air, which, being mixed, are ignited on coming in contact with the highly-heated substance, and in mixing with the heated gases contained in the cylinder raise their heat to an amount equal to that of the losses of heat sustained in consequence of their expansion behind the working piston and from incidental causes." The gases may be ignited by heated metal or fire-clay previously placed in the combustion chamber, a platinum wire heated by a galvanic current, or sponge of platinum; or this tube itself may be heated by a blow-pipe. If the gases are pure hydrogen and oxygen in due proportion steam is produced. If carburetted hydrogen gas and atmospheric air are used, a mixture of steam carbonic acid, and a large proportion of nitrogen will result from their combustion, and will constitute the working medium of the engine, a portion of such mixed gases being discharged at each stroke as before, when steam only was used."

[Printed, 1s. 10d. Drawings.]

A.D. 1860, September 4.—N° 2132.

STANDLY, HENRY JOHN.—(*Provisional protection only.*)—"Improvements in the production of gas for illumination and other purposes, and the utilization of the products arising therefrom."

This invention relates to the treatment of the nitrates and other compounds of soda, potassa, and other alkaline salts, and also of the residuum left after extracting the oxygen gas therefrom. This is effected by "combining with the salt employed (in the retort) a metallic base, as iron, zinc, or other metal, and also in passing the oxygen gas evolved from the salt through a lixivium or solution of the residuum remaining after the salt has been deprived of so much of its oxygen as will be disengaged

“ by a moderate heat (which residuum I obtain from a previous charge), by which it is freed from other gases which have passed over with it from the retort, and which latter combining with the solution, forms a precipitate (the nature of which is dependant upon the character of the metallic base employed in the retort,) which, after having separated it from the liquid part of the solution, I convert by washing and filtration into a useful pigment; and I further cause the liquid part of the solution which contains alkaline matter to be evaporated, from which I obtain a caustic alkali. This operation may be repeated for the continuous production of the products before named. I further effect the complete purification of the oxygen gas, when the production of the two products before named is not required, by simply dissolving the product of the evaporated solution last named in water, through which I pass the oxygen gas evolved from the salt, so that any nitrous or other gaseous product passing over with the oxygen gas may be arrested in its passage to the receiver, and the residuum left in the retort I treat as before stated, obtaining the before-named useful products in addition to the oxygen gas.”

[Printed, 4d. No Drawings.]

A.D. 1860, September 5.—N^o 2148.

HUGGETT, JOHN.—“ A method of, and apparatus for, regulating the light in street and other lamps, whereby the relighting and extinguishing of the same may be dispensed with.”

This invention consists in acting upon a tap, through which gas is supplied to a burner or burners, through arms, rods, or levers worked by a diaphragm or piston, which is made to rise and fall in a suitable vessel by air or other fluid forced into and drawn from such vessel. Supposing no light to be required, the diaphragm and its piston will be down, the tap inside the lamp closed, and the end of the rod opposite that connected with the piston will be raised, and the shade will be raised so as to screen the burner; a minimum quantity of gas will be supplied through a small bent supply tube furnished with a regulating cock carried from below, entering the supply pipe above the tap, and having been once lighted will remain so as long as there is any supply through the main supply pipe. To light up, air is forced

into the air vessel, whereby the diaphragm and piston are raised, the tap opened, and the shade lowered.

[Printed, 6d. Drawing.]

A.D. 1860, September 8.—N° 2174.

YATES, FREDERIC.—(*Provisional protection only.*)—"Improvements in apparatus for, and in the mode of, manufacturing iron, steel, and other metals and substances, gaseous and solid fuel being thereto applied as the heating, reducing, cementing, and oxydizing agents."

1. Improved furnace for the reduction and cementation of iron, and the reduction and oxidation of other ores, metals, and substances, as lead, copper zinc, and prussiate of potash. 2. Application of gaseous fuel as the heating, reducing, and cementing agent, conjointly with solid carbonaceous matter, in treating iron and other metals, ores, and substances. 3. Improved oscillating furnace for smelting the products of reduction, cementation, and oxidation, and for puddling the cast iron. 4. Improved apparatus for feeding the gas generators or fire-places for the production of the gaseous fuel, the generators being similar to N° 185, A.D. 1860. This filling apparatus or box has on its upper side a conical hopper, and is fitted with a moveable slide working air-tight inside it. The upper side of this slide consists of a plate fitting air-tight against the under side of the top part of the box. On the under part of the plate or tail of the stopper is a rack which works into a small pinion fixed on a shaft working through the sides of the box, "thereby enabling the slide by means of a wheel and handle to move backwards and forwards in a horizontal plane, and in this way pushing the fuel into the generator and keep it air-tight all the time."

[Printed, 4d. No Drawings.]

A.D. 1860, September 10.—N° 2183.

CANTAGREL, FRANÇOIS JEAN.—"Apparatus for ascertaining the existence of escapes in pipes and vessels for conveying (and holding), lighting and heating gases, which apparatus he denominates 'Escape Indicator.'"

The apparatus consists of—1. A "compressor" or elastic pear-shaped bag or bladder mounted on a pipe which is connected with the pipes, apparatus, or vessels holding or conveying gas.

2. Of a "manometer," also an elastic organ, in direct communication with the surrounding air by means of a perforated appendage, and with a branch communicating when desired with the apparatus to be inspected. 3. Of a cock so disposed as to set these two organs in connection, and also to place the "manometer" in connection with the external air. To ascertain the existence of escapes the large bladder is compressed. If no escape exists, the small bag becomes inflated; if there is an escape, it remains in a collapsed state. For testing large spaces, such as those in gas-works, bellows having no opening outwards are used.

[Printed, 6d. Drawing.]

A.D. 1860, September 13.—N° 2210.

RANSFORD, ARTHUR.—"Improvements in galleries or supports for gas shades."

"Instead of the three-armed gallery or support with its central supply pipe and burner as hitherto used, I make the gallery or support in the form of a segment of a circle, with a screwed socket or connection at the outside edge thereof, and a burner socket projecting inwards in a standing position, the said connecting socket being tapped to screw on the 'gas-fitting' or supply pipe, so that when the glass shade is put on the gallery, and secured by a thumb screw in the usual manner, there will not be any shadow thrown, as is the case with the ordinary galleries and supply pipes now in common use. With this arrangement . . . free access is left to light the gas."

[Printed, 8d. Drawings.]

A.D. 1860, September 14.—N° 2220.

LAUNAY, CHARLES THEODULE, and DE VERNEZ, AUGUSTE MARIE ALEXANDRE DOMINÉ.—"Improvements in treating coal naphtha, and in apparatus employed therein."

The raw or crude naphtha or light oil is submitted to the repeated action of sulphuric acid passing through successive vessels filled with such acid, while suitable dipping pipes cause the naphtha to enter near the bottom of each vessel, whereby the said naphtha is "deprived of those parts that make crude coal naphtha less suitable for the naphthalizing of illuminating gas than that treated according to our methods. After this, for

“ still more improving the naphthalizing property of the naphtha,
 “ the same is caused to run through a filter, which we prefer to
 “ be composed of coke broken into pieces of about the size of a
 “ nut, mixed with small pieces of chalk and clay, and some proto
 “ or perchloride of iron, zinc, or other suitable basis; or instead of
 “ this filtering, the naphtha may be submitted to distillation, and
 “ finally, if required, be clarified by means of gelatine, glue, or
 “ other suitable clarifying materials. The purified naphtha thus
 “ obtained may then be used for naphthalizing illuminating gas.”

[Printed, 8d. Drawing.]

A.D. 1860, September 15.—N° 2241.

DAVIES, GEORGE.—(*A communication from J. T. Van Kirk.*)—

“ Improvements in lamps for burning coal oil and other like
 “ combustible fluids, part of which improvements is applicable
 “ to gas-fittings.”

This invention consists—1. In providing the lower flange of the hollow cone or air deflector enclosing the upper end of the wick tube, and upon which the flared end of the chimney rests, with a number of ribs or corrugations, so as to form a number of air passages round and beneath the lower flared end or edge of the chimney, thus supplying oxygen to the flame, and keeping the chimney cool. 2. In a method of securing the chimneys or shades of such lamps by means of a spring bolt, the spring being so arranged as to yield as the chimney expands by the heat.

[Printed, 2s. Drawings.]

A.D. 1860, September 17.—N° 2253.

HANSOR, JAMES.—“ Improvements in the manufacture of coal
 “ gas.”

The objects of this invention are—1. To obtain a greater yield and purity and a higher illuminating power. 2. To prevent deposit in the retorts. 3. To diminish the heat to which the workmen are exposed. 4. To diminish the labour of manufacture, and make the same more cleanly. “ In working with three
 “ retorts, two of them are to be charged with coals placed in . . .
 “ ‘ cradles ’ in such a manner that the coals do not come in contact
 “ with the retorts in which the cradles . . . are placed. I propose
 “ that two such retorts, which for convenience I will call radiators,
 “ being heated to a proper degree, shall impart sufficient heat to

" the cradles placed within them to cause the vapours of the
 " coals within the cradles to be evolved and to pass with moderate
 " rate rapidity into the third retort, which must be of larger
 " dimensions than the radiators. Within the third retort (heated
 " to a proper degree for converting vapour into gas) are to be
 " placed metal plates or other substances, arranged in suchwise
 " that the vapours evolved from the coals in the cradles must
 " impinge upon and pass over every part of the incandescent surfaces
 " of such plates or other substances while passing through
 " the third retort, so that the vapours must be converted into
 " permanently elastic gas."

[Printed, *sz.* Drawing.]

A.D. 1860, September 17.—N° 2259.

HAY, JOHN.—(*Provisional protection only.*)—"Improvements in
 " machinery or apparatus for making gas-burners."

" I arrange or construct a machine, with apparatus on the top
 " of the frame thereof, to fix a number of movable drills for
 " drilling and coneing or forking the inside of gas-burners. The
 " said apparatus is formed of two parts, one part to hold the
 " drills and the other the metal of which the burners are made;
 " then the drills are caused to revolve either by hand or power,
 " and that part of the apparatus which holds the series of tools
 " or cutters is caused to slide forwards, so that the tools and
 " metal come in contact, and by means of a shaper, acted upon
 " by a pointer or tracer, the requisite form or shape is given to a
 " number of gas-burners at the same operation."

[Printed, *4d.* No Drawings.]

A.D. 1860, September 18.—N° 2269.

NEWTON, WILLIAM EDWARD.—(*A communication from Nathaniel Tufts, junior, Augustus Tufts, and Simon G. Cheever.*)—"Improvements in gas-meters."

This invention relates to dry gas-meters, and consists in forming the flexible chambers so that they can be readily removed and inserted in the meter without soldering or unsoldering. The bellows are formed with two heads or annular plates, to which the leather or other flexible material is secured previous to insertion in the meter, the rear plate or head having a female screw formed in it, which fits over a corresponding male screw formed in it,

which fits over a corresponding male screw attached to the pipe through which the gas is admitted to the bellows. The bellows thus formed can be finished and tested before being placed in the apparatus.

[Printed, 10d. Drawing.]

A.D. 1860, September 18.—N° 2272.

REECE, REES.—“Improvements in treating lignite and certain bituminous mineral substances so as to obtain products therefrom.”

This invention consists in burning and distilling lignite and certain bituminous mineral substances, “such as parrot and cannel coal, schistus rocks, shale, and the mineral substances known as boghead coal or Torbane Hill mineral, in a furnace by the aid of a blast, so as to obtain inflammable gases, tar, and other products therefrom.” The blast furnace is similar to that ordinarily used for smelting purposes, but closed air-tight on the outside with sheet iron. A cover plate is on the top of the furnace, and a suitable feeding hopper is fixed, provided with a closing door, which is kept shut during the process of distillation. The fire being lighted, a gentle blast is put on, the hoppers are closed, and the products of combustion and distillation pass off from the furnace into the hydraulic main, and thence through the condenser. From the condensers the gas passes into the scrubbers, where it is well washed by a stream of water. The blast is gradually increased so as to raise the temperature within the furnace sufficiently high to reduce the carbonic acid generated at the tuyeres into carbonic oxide.

[Printed, 10d. Drawing.]

A.D. 1860, September 19.—N° 2279.

MARTIN, EMILE, and GUDIN, THEODORE.—(*Provisional protection only.*)—“Improvements in apparatus for manufacturing gas when dissolving zinc or iron in dilute sulphuric or other acid.”

A perforated metal or gauze basket is placed in and somewhat above the bottom of a cylinder closed beneath and open at the top. Into this vessel another vessel of a similar form is introduced which is closed at the top and open at the bottom. The upper part of the inner vessel has three horizontal partitions, the two

lower perforated, the third imperforated and having two bent tubes fixed through it in such manner that the gas may pass up through such bent tubes and then descend and pass out at the other ends of these tubes, which are immersed in a hydrocarbon fluid placed on the upper partition; and in order that the gas as it emerges from the fluid may be divided into numerous streams, the ends of the bent tubes are extended horizontally over the upper partition and perforated. The gas is conveyed from the upper part of the interior vessel by a pipe with a stop-cock, the pipe having several partitions of fine gauze or perforated metal to prevent explosion. The zinc or iron being placed in the basket, and dilute sulphuric or other acid introduced into the outer vessel, the hydrogen gas evolved passes through the perforated partitions, on one of which is laid pumice stone impregnated with a solution of potash, and on the other pumice stone saturated with sulphuric acid. The gas combines with the hydrocarbon on the upper partition, and in this state goes off to be burned, and so long as the gas is conducted off the production continues. On the cock being closed, the pressure of the gas in the interior of the vessel causes the dilute acid to be forced away into the other vessel, so as to leave the zinc or iron in the basket free from contact with the acid. The gas may, when desired, be conducted off without being carburetted, and burned by the aid of platinum.

[Printed, 4d. No Drawings.]

A.D. 1860, September 26.—N^o 2332.

FERRABEE, JAMES, and FERRABEE, HENRY.—(*Provisional protection only.*)—"Improvements in apparatus for lighting, heating, ventilating, and cooking by gas, and part of which invention is applicable to heating apparatuses of other descriptions."

The apparatus consists of an inner and outer case, there being a space in all directions between the two. The bottom of the outer case has a regulating valve for admitting air, and the top is fitted so as to make it when the valve is closed almost air-tight. Within the inner case are the burners in connection with a supply pipe passing through the outer and closed bottom of the inner case. The inner case has apertures for air to support the combustion. The inner case is fitted with a nozzle or a pipe to carry off the

products of combustion, such nozzle or pipe communicating with a flue or other outlet, and being fitted with a regulating valve. Glass is introduced into the inner and outer vessels so as to allow of the gas transmitting light. Bread may be baked and various cooking operations performed in the space between the inner and outer case. The inner case is sometimes made double and fitted with pipes so as to supply a bath with warm water. "We also construct lamps for gas with inner and outer cases of glass, or glass and metal, or some other material, and fitted with valves or nozzles as before described; and we make an apparatus consisting of two or more such lamps connected with one outlet pipe for carrying off the products of combustion."

[Printed, *4d.* No Drawings.]

A.D. 1860, September 26.—N^o 2342.

BUCHHOLZ, LUDWIG.—(*Provisional protection only.*)—"Improvements in carbonizing sawdust and other finely-divided vegetable substances, and in obtaining certain useful products by such carbonization, and in apparatus connected therewith."

The sawdust, &c. is placed in a close vessel to which steam is admitted by perforated pipes or otherwise, by which air and aqueous vapour or water are expelled, and the carbonization carried on by heat from a fire. The apparatus used is a vertical retort, within which is a perforated vessel capable of being charged at top. At the lower end is a slide which opens an aperture for the discharge, and the charcoal then falls or is driven into a close chamber beneath. "The products I obtain besides the charcoal are acetic acid, acetate of lime, of soda, or other acetate, naphtha, and gas for illumination and heating. In obtaining these or part of them, I cause the gases or vapours given off during the carbonization to pass firstly into a lower vessel, so arranged as to condense and receive the tar, the remaining vapours then pass upward through a vessel containing lime or other base for an acetate, and kept at a suitable temperature for arresting the acetous vapour, but allowing the remainder to pass through a worm or other refrigerator where the naphtha is condensed, and the gas for illumination or heating is then collected by ordinary apparatus."

[Printed, *4d.* No Drawings.]

A.D. 1860, October 1.—N^o 2371.

HENRY, MICHAEL.—(*A communication from Guillaume Amedée, Filhoi Peyre, and François Barthélemy.*)—(*Provisional protection only.*)—"An addition to or improvement in gas-meters."

The meter is furnished with a graduated index plate, with a pointer worked by the ordinary axis of the meter sufficiently rapidly to indicate perceptibly the waste or loss, "which may be done by so contriving the connections for working the pointer that the motion communicated to it may be much more rapid than the ordinary motion of the meter; or the pointer may be stationary, and the dial or index plate movable under it. . . . There may be more pointers than one; as, for example, three travelling on a graduated segment so that one would be always in view; and in one arrangement, which is that which I prefer, I work them by putting on their axis a toothed wheel, which gears with a wheel on the upright spindle worked by the horizontal axis of the meter, but is so contrived as to turn the pointer axis much faster than the spindle, and I prefer to place my dial or graduated index plate prominently in the consumer's view."

[Printed, 4d. No Drawings.]

A.D. 1860, October 17.—N^o 2523.

KUKLA, FRANCIS XAVIER.—(*Provisional protection! only.*)—Improvements in gas stoves.

"The top of the supply pipe is covered by a hollow conical or cylindrical vessel, the aperture of which is placed downwards. The said vessel is surrounded by a second larger covered vessel, conical or cylindrical, the upper part of which is perforated by numerous small holes for the gas to pass through. The gas from the supply pipe, on entering the interior of the said hollow vessel, will become greatly expanded in volume by the heat of the same, and will be forced into the space between the two vessels, and through the said perforation, and is then exposed for combustion." "With gas obtained from volatile liquids a wick must be substituted in place of the supply pipe."

[Printed, 4d. No Drawings.]

A.D. 1860, October 17.—N^o 2532.

DUCKHAM, HENRY ALEXANDER FREDERICK.—"Improvements in gas-meters and regulators."

1. Peculiar combination of gas regulator and wet gas-meter in which the regulator is disposed so as to embrace and enclose the upper part of the measuring wheel, being both within the same case. A self-acting water reservoir is made by placing a tube leading from the bottom of the reservoir, and terminating a little below the water level. At the upper part of this tube is a valve closed by a screw, rod, or other contrivance passing through a suitable packing in cover of the reservoir to keep it air-tight. The valve is closed during the filling, and opening after the reservoir is charged. 2. Dry gas-meter in form of a drum, with four, five, or more expanding measuring chambers radiating from the axis, the latter having suitable passages for the admission into and escape of gas from the chambers, the expansion of which drives the drum round by contact with suitable stops. 3. Improvement in Curley's gas regulator, consisting (1) in the application of an inner lining forming an annular chamber between the inner and outer case; (2) in the application of a floating ball or other valve in the filling tube or syphon of the regulator at the proper level of the water, and carrying that tube to a height much above that level; (3) application of the safety valve to open inwards instead of outwards, and the use of lever instead of lift valves. 4. Enclosing mercurial regulators with [double-action safety valves, so that they shall not be brought into action until a sufficient supply of quicksilver is in the regulator, also, in case of tilting the valve, closes so as to shut off the gas; also the application of floating valves to regulate these regulators to a pressure suitable for argand burners. 5. Application of metal surfaces to the flexible diaphragms of dry gas-meters and regulators, covering as much of the flexible material as possible, at the same time without interfering with the action of the meter or regulator, and thereby to prevent percolation of the gas through the diaphragms as much as possible. Instead of metal plates the flexible diaphragms are sometimes coated with a composition of gelatine and alum. 6. Enclosing dry gas-meters entirely within an outer case when placed in houses, and ventilating such case by a channel or channels of communication leading outside the building.

[Printed, 1s. Drawing.]

A.D. 1860, October 22.—N° 2574.

WADSWORTH, JOSEPH, and WADSWORTH, JAMES.—
“Improvements in gas-burners, and improved modes of manufacturing the same.”

The improvements in solid gas-burners consist in causing the internal cavity or canal of the tube to terminate towards the apex of the burner in a small bulb or enlargement of the cavity, from which bulb the orifices at which the gas is lighted proceed. In sheet metal burners, in narrowing the tube of the burner a little below its apex, so as to form a neck or contracted passage, above which and between it and the orifices or orifice through which the gas issues for consumption the upper part of the burner is formed into a small bulb or hollow chamber or cavity. The improved modes of manufacturing gas-burners consist in cutting the same out of sheet metal, and "imparting the required configuration by stamping, compressing, or drawing with or through dies, matrices, or punches, and (generally but not always) by the process or operation known as 'knurling' or 'riveting,' the parts being finally united (if formed separately), and the proper orifices made by drilling, or sawing, or punching, and compressing; also in constructing burners partly by the means above indicated and partly by ordinary modes, as, for instance, by uniting a stem or tube, formed as in a common burner, with a nipple, tip, or apex of stamped sheet metal, or uniting a stem, pipe, or tube of sheet metal with the ordinary nipple."

[Printed, 8d. Drawing.]

A.D. 1860, October 24.—N° 2597.

CHISHOLM, JOHN, CHISHOLM, GEORGE, and KENT, ROBERT THOMAS.—"An improved method of obtaining compounds of nitrogen."

Atmospheric air, after being passed through a fire or furnace, is subjected to the action of hydrogen obtained by the decomposition of steam or from other source. Sometimes electric action is used in the process. "We sometimes use, in addition to the foregoing agency or agencies, compounds of potassium, sodium, barium, or strontium, or substances of that class, to effect combinations and take up products . . . according to the particular nitrogenuous compound we desire to obtain."

[Printed, 4d. No Drawings.]

A.D. 1860, October 25.—N° 2603.

MANN, WILLIAM.—"Improvements in apparatus for washing and condensing gas."

The improvements in the washing apparatus consist in the employment of a syphon tube, the lower part of which enters the "scrubber." The tube is then bent and turned at the extreme end through a stuffing box in the centre of the cover of the scrubber. A tray filled with birch, pebbles, coke, or other like suitable material is attached to a shaft so as to revolve with it. A pulley is fitted on the shaft, and a rigger on the lower part of the syphon tube. A belt passes round the pulley and rigger, and imparts rotary motion from the shaft to the tube. The top of the syphon tube is furnished with a funnel into which a continuous supply of water or other washing liquid is fed. Under the tray is placed a supply of pebbles, coke, &c., through which the gas is made to rise. Rotary motion being imparted to the tube, the bottom of the latter is made to describe a circle inside the scrubber between the side and the central shaft, thus distributing the washing liquid continuously over the pebbles, coke, &c. The improvements in condensing apparatuses consists in surrounding the ordinary condensing pipes with a series of brushes or rubbers of cotton or other like material, which are made to rise and fall up and down the pipes between the trays or troughs fixed at intervals on the pipe and supplied with water, which is fed into the uppermost trough, the overflow from which enters that next below it, and so on to the lowest trough. Each time the rubbers enter the troughs they take a supply of water, and in ascending and descending pay it over the pipes. Where the condenser pipe are vertical the brushes or rubbers are made to revolve round them, and are supplied with water from a trough underneath.

[Printed, 6d. Drawing.]

A.D. 1860, October 26.—No 2616.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Athalis Delaporte.*)—(*Provisional protection only.*)—"Improvements in uniting water, gas, and other pipes and tubes."

The union is effected "by means of a collar free to slide along the tubes, and so formed as after being brought over the abutting ends of any two pipes required to be joined to leave a space between the inner surface of the collar and the pipes. The collar is made with an aperture for the purpose of pouring in a mastic or cement, which, on setting together with the collar, forms a hermetic joint. The pipes are formed by preference

" with annular grooves at their ends for giving a better hold to
" the mastic, or the ends of the pipes may be made with tongues
" or projections which enter grooves in the sliding collar, the
" joint being made tight by cement or mastic applied in a heated
" or cold state. In some cases the grooves are formed to permit
" of the collar being turned more or less to force the ends of the
" pipes together. Again, sheets or rings of india-rubber may be
" placed over the ends of the two pipes to be joined wrapped
" with wire or cord, and then covered by the sliding collar, mastic
" or cement being used at the ends of the collar."

[Printed, 4d. No Drawings.]

A.D. 1860, November 1.—N° 2673.

EDWARDS, WILLIAM.—"A self-acting apparatus for regulating
" and adjusting the pressure of gas and other fluids."

This invention consists in employing what is called an inverted syphon, containing mercury or other fluid, the fluid in one leg of the syphon being pressed upon by the atmosphere, and in the other by the gas or other fluid whose presence is to be regulated and adjusted. On the surface of the mercury in one of the legs rests a float, which is connected to a valve which closes the aperture through which the gas or other fluid passes; when the supply, and, consequently, the pressure of the gas or other fluid is too great, it forces the mercury into the opposite leg against the pressure of the atmosphere, the float descends, and with it the valve; this action partially closes the aperture, and restrains the pressure and supply of the gas or other fluid; but when the pressure and supply of the gas or other fluid is too little, the pressure of the atmosphere forces a portion of the mercury into the leg opposite to the one on which it acts; this raises the float and with it the valve, by which action a greater supply and, consequently pressure of the gas or other fluid is obtained.

[Printed, 8d. Drawing.]

A.D. 1860, November 5.—N° 2711.

WEBSTER, JAMES.—(*Letters Patent void for want of Final Specification.*)—"Improvements in obtaining gas (mainly oxygen)
" for improving artificial light and for other purposes; also for
" utilizing the products resulting from its manufacture."

"To bring into practice my improvements, I use an iron or
" other retort, in which I place nitrate of potash, or other nitrates,

“ and submit the same to a bright red heat in a suitable furnace.
“ A small quantity of carbonic acid gas is first given off, which is
“ allowed to escape, after which nearly pure oxygen gas is generated with a small amount of nitric acid, which nitric acid may
“ be condensed in the usual way. The gas is collected by pipes
“ and receiver without any further process, but may be passed
“ through lime water to free it from any impurities. After the
“ gas is collected, an alkali residue remains in the retort; this
“ residue is taken out and placed in the atmosphere to absorb
“ oxygen again; or steam may be blown into such residue to
“ replace oxygen for that which has been extracted; it is then
“ ready for use again; or the residue from the retorts may be
“ used for other purposes.

[Printed, 4d. No Drawings.]

A.D. 1860, November 6.—N° 2716.

FROGGATT, JOHN, junior.—“ An improvement in apparatus
“ for burning gas.”

This invention consists of a peculiar burner for the use of gas in heating or singeing yarns, lace, or textile fabrics, or for other purposes wherein the flame is required for heat or burning, in contradistinction to the general purposes of illumination. This apparatus is designed to produce the clear blue jet of gas flame and consume the smoke; it consists “ of a tube having a somewhat larger aperture (of any suitable form) at the point of
“ ignition than usual, and immediately below and around the
“ burner, at a suitable distance, orifices, holes, or slots are formed
“ in the sides of the tube or burner, by which the atmospheric
“ air enters the tube, the peculiar and precise position of the
“ openings being designed to ensure the most effectual consumption of the gas and all deleterious impurities, and thereby
“ causing the flame to be perfectly smokeless, which, combined
“ with intense heat, is the chief requisite for such operations.”
The orifice at the point of ignition may be divided so as to produce two flames close to one another.

[Printed, 4d. No Drawings.]

A.D. 1860, November 16.—N° 2812.

BÉZIAT, JEAN CIRILLE MARIUS. — “ Improvements in the
“ means or apparatus employed for permitting, stopping, and
“ regulating the passage of steam, water, and gases.”

“ For this purpose I employ a valve opened and closed by a
“ helix (hélice) or sort of screw action ; that is to say, I form in
“ the valve stem or spindle a helical or spiral groove path, slot, or
“ channel of the curve or shape of a screw thread, in which works
“ a pin or projecting piece on a rod, so that by turning the rod
“ or the spindle the opening or closing of the valve is effected to
“ the desired extent, and the passage of the steam, gas, or water
“ permitted, interrupted, or regulated.”

[Printed, 8d. Drawing.]

A.D. 1860, November 16.—N° 2826.

GLOVER, GEORGE. — “ Improvements in apparatus used in
“ measuring gas.”

For these “ purposes an inverted cylindrical vessel closed at the
“ upper end, similar to those heretofore, is used. The vessel is
“ made of an alloy of tin and antimony, or glass and aluminium,
“ so as not to be affected by gas, and to part more readily with
“ water. On the exterior and at the opposite sides of this vessel
“ are applied two graduated scales of the same alloy as the vessel.
“ This vessel is used inverted, and immersed in water contained
“ in a suitable tank as heretofore, and the vessel is also suspended
“ and kept in a state of equilibrium as heretofore. And in order
“ to read off the graduated scales, a small micrometer in a frame
“ on the margin of the tank is used to each graduated scale. The
“ cocks or valves employed in conducting gas into and from the
“ measuring vessel are lined with alloys of the metals before
“ mentioned, in order that the gas may not act on any parts of
“ the cocks or valves. . . . Two differential thermometers
“ are used, one at the outlet of the vessel and one at the outlet
“ of the gas-meter, or gasometer, or instrument which is being
“ tested. These thermometers are graduated from 30° to 90° of
“ Fahrenheit’s scale on one side of the tube, and the other sides
“ of the tubes are graduated for percentages of error, to indicate
“ variations depending on temperature and the capacity of gas
“ for moisture.”

[Printed, 10d. Drawings.]

A.D. 1860, November 17.—N° 2831.

LÉVÊQUE, ALEXANDRE LOUIS.—(*Provisional protection only.*)
—“ An improved apparatus for carburating or naphthalizing
“ lighting gas.”

The principle of this invention consists in keeping the hydrocarbon liquid used at a constant level in the apparatus. In the interior of a box, hermetically sealed, and provided with pipes for the introduction and exit of gas and liquids, is situated a reservoir of hydrocarbon fluid, "which reservoir, open at the top, is either supported on three or more spiral or other suitable springs or floats on water or other suitable liquid contained in the interior of the box up to the required level, in such manner that in the same measure as, in consequence of the absorption of the naphthalizing liquid by the gas, the reservoir becomes lighter the same will rise, and thus keep the surface of the naphthalizing liquid contained therein at the same level. Cotton or other suitable wicks are suspended from the top of the box and pass through the perforations of a perforated plate situated on the top of the reservoir, while the lower ends of the wicks dip into the naphthalizing fluid contained in the reservoir, the first-mentioned perforated plate preventing the gas from coming in direct contact with the naphthalizing liquid in the reservoir, but only allows the gas to saturate itself with the naphthalizing liquid while passing between the wicks, the capillarity of which latter causes the naphthalizing liquid to rise in them."

[Printed, 4d. No Drawings.]

A.D. 1860, November 19.—N^o 2836.

JOWETT, HENRY ALFRED. — (*Provisional protection only.*)—
"Improvements in the method of heating or firing ovens for the manufacture of pottery and porcelain by means of gas, and in apparatus connected therewith."

The gas in this invention is used in combination with steam, so as to have the effect of a "blow-pipe" flame. The construction of the burners, by which the gas, air, and steam are employed in combination, vary with the shape of the oven in which the saggers or retorts with the articles to be fired are placed. The details are given of a round oven built on this principle of solid bricks and hollow brick burners, the hollow bricks being made of fire-clay, with separate compartments for the introduction of the three agents. On one side of the hollow brick is attached in moulding a fire-clay tube, two inches in diameter and six inches in length, at an angle of 45°, the end of which is moulded on the brick

being in the upper compartment for gas, and the lower one, being for the admission of air and steam, by a transverse division in the lower compartment of the brick.

[Printed, 4*d*. No Drawings.]

A.D. 1860, November 22.—N^o 2858.

VARLEY, SAMUEL ALFRED, and VARLEY, CROMWELL FLEETWOOD.—“Improvements in the regulation of heat, parts of the “invention being applicable to other purposes.”

The principal feature of the invention is the regulation of heat whenever a uniform temperature may be required, and its chief peculiarity consists in the construction of a particular form of self-acting valves, called, from their being affected by change of temperature, “thermo-regulators.” Where gas is used as the source of heat the valve consists of a tube, to one end of which is attached a vessel which answers the same purpose as the bulb of an ordinary thermometer; the other end of the tube is bent into a U. Fluid is poured into the bent tube, and as the temperature of the chamber rises, the fluid in the bulb and tube expands, when the mercury is raised so high as to close the mouth of a sliding tube adjustable at any desired distance from the surface of the fluid; on the temperature being lowered the fluid falls, unclosing the mouth of the tube, when the gas is again turned on and relit by a small burner.

[Printed, 1*s*. Drawing.]

A.D. 1860, November 22.—N^o 2865.

AULD, DAVID.—“Improvements in regulating the pressure and “flow of fluids.”

As applied to water, the apparatus consists of a weighted lever-valve working upon a seat in the line of pipe. The valve chamber which forms part of the pipe has arranged within it a vertical spindle, having at its lower end a valve with a corresponding seat. The upper end of the spindle has attached to it a flexible diaphragm and a recessed disc-piece of metal has a working surface for the diaphragm. The valve spindle is weighted in any convenient manner. The inflowing water is admitted between the lower valve and the upper diaphragm; as its pressure increases the force on the diaphragm correspondingly closes the valve, and

thus reduces the pressure upon the efflux side. "This apparatus may be used under various forms and in various conditions, and, if reversed, it answers admirably for steam purposes, or for regulating the pressure of steam or other aeriform fluids. In any case the reactionary pressure upon or against the base of the valve operates so as to aid in the pressure-regulating action. Instead of a flexible diaphragm a piston or other detail movement may be used. The valve may also be fitted as a stop or shut-off apparatus by so arranging the parts that the thoroughfare may be entirely closed by a screw or other means."

[Printed, 8d. Drawing.]

A.D. 1860, November 24.—N° 2882.

BOWDITCH, WILLIAM RENWICK.—"Improvements in the purification of coal gas and of coal oils."

1. Coal gas is passed through or over the hydrates of potash soda, baryta, magnesia, and alumina, the oxides of manganese iron, copper, tin, zinc, or other metals, either in the hydrated or anhydrous condition, except hydrated peroxide of iron and hydrate of lime, or through a mixture of any of these substances heated to a temperature between 120° Fahrenheit and red dulness. 2. Coal gas is also passed with steam through or over charcoal, coke, or a mixture of them with alkalies, and also through the above-named materials or a mixture of them, heated between 212° Fahrenheit and a dull red heat. 3. Coal gas is passed with steam through vessels, heated to about 500° Fahrenheit, which will contain the steam and gas, the steam being rendered ammoniacal with free ammonia or otherwise as desired. After the gas has been passed through the above-named heated materials, it is cooled and passed through the ordinary cold purifying materials."

[Printed, 4d. No Drawings.]

A.D. 1860, November 26.—N° 2897.

SHIRTCLIFFE, WILLIAM RICHMOND.—(*Provisional protection only.*)—"Improvements in warm baths."

The principal feature of this invention consists of a portable double cylinder or two concentric tubes enclosing two small vertical pipes in the concentric space between them; the outer cylinder is closed at the bottom, and the space between the two cylinders closed at the top. The inner cylinder is the shorter, and

terminates a sufficient distance from the bottom to admit of a small perforated horizontal pipe being placed so as to connect the two vertical pipes in the concentric space between the cylinders. These pipes do not reach within an inch of the top or connection between the two cylinders. "The heat generated by the combustion of suitable material in the burner or heating apparatus is applied to a bath, with the under side formed so that the heat may readily act upon the water contained in it."

[Printed, 4d. No Drawings.]

A.D. 1860, November 28.—N° 2916.

ROBB, JOHN.—"Improvements in gas stoves."

This invention consists of certain arrangements whereby a great amount of heat is obtained and distributed "without the objectionable circumstances frequently attendant upon the contrivances previously in use." One or more burners is or are fitted to a metal or stoneware frame, on which is a cylindrical or other glass case open at the bottom and top for the admission of a free current of air, which in its passage becomes very hot, and heats the apartment or place in which the apparatus is placed directly and by radiation, the current of heated air being kept up so as to prevent any offensive or deleterious vapour or effluvia. On or above the top of the cylinder or case there rests or is suspended a glass dome of greater diameter than the cylinder or case, and a clear space being left between them the effect of the dome is to intercept the heated air and diffuse it through the apartment or place in which the apparatus is situated. "The gas should be mixed with atmospheric air before burning, and any of the burners in common use may be employed, but I prefer those made of the material termed 'adames,' consisting of a plate of suitable size to fit the top of the chamber used for mixing the gas with atmospheric air, and perforated with a suitable number of holes according to the degree of heat required."

[Printed, 6d. Drawing.]

A.D. 1860, December 3.—N° 2958.

KEEN, RICHARD EDWARD.—"Improvements in cocks, taps, valves, and other apparatus for stopping and regulating the flow of liquids, steam, and gas."

This invention consists—1. In a combination of two distinct and independent means of stopping and regulating the flow of

liquids, &c., such that the flow of the liquids, &c., is first checked by the sliding, turning, or otherwise passing of one or more portion or portions of the apparatus over, into, or across the aperture through which the liquids, &c., flow, and is finally stopped "by the same or other portion or portions forming with or without the remaining part or parts of the apparatus a valve and seating, or plug and socket, to be assisted or not, as occasion may require, by further means of stopping and tightening the same, and consequently providing at least double security, the pressure being so checked by the first part of the action, and the resistance thereof so sustained by the parts when at rest, that the valve parts of the apparatus are protected not only from the strain and wear, but also from the corrosion and other prejudicial effects consequent upon the constant pressure or other action of the liquids, steam, or gas upon them." 2. In making such combination of parts self-acting.

[Printed, 6d. Drawing.]

A.D. 1860, December 10.—N^o 3023.

BARDE, JOSEPH ANTOINE.—"An improved portable apparatus for producing and purifying lighting gas."

This invention consists in making the purifier form a small gasometer, called by the inventor an "interior gasometer," inasmuch as it may be put up in a room, kitchen, workshop, &c., the evolution of the gas taking place in the same room, or in close proximity to the gasometer. From the retort, which may be set in an ordinary kitchen range or other furnace, the gas is conducted by a bent pipe into the purifier, while a branch pipe, fitted at the lower part of the bend and dipping with its lower end into the water of a reservoir, carries the tar or other products collected in the bent part into the reservoir. The purifier consists of three chambers screwed together one above the other. At the outside on the top of the outermost chamber, which acts as a hydraulic main, is fitted a movable lid with a hydraulic joint to prevent escape of the gas. The gas pipe dips with a syphon end into the water with which the uppermost chamber is partly filled. Towards the top of this chamber is placed a lime purifier, divided by a horizontal partition. The gas passes from this purifier to the upper part of the third or lower chamber, which is also partly filled with water, while the lower part of this chamber is connected by a bent pipe to the lower part of the second or intermediate

chamber in such a manner that by the pressure of the gas the water from the lower chamber is forced up into the second chamber, from which it flows back into the lower chamber on the opening of a cock in a pipe leading from the upper part of the lower chamber to the gas-burners.

[Printed, *sd.* Drawing.]

A.D. 1860, December 13.—N^o 3064.

CLARK, WILLIAM.—(*A communication from Heber Marini.*)—(*Provisional protection only.*)—"Improvements in the manufacture of gas."

This invention consists in introducing into retorts during the distillation of coal a large amount of pure hydrogen gas of little lighting power, stored for the purpose in suitable gas holders, in which it is received without any purification. It is heated by the waste heat of the furnace before it enters the retorts. "The gas is intended to act on the carburetted vapours evolved in the retort, and to combine with the lighting gas. It will at the same time protect the olefiant gas from the contact of red-hot parts of the retort, first by its interposition, and afterwards by the impulsive force it gives to the products of distillation, which will be expelled very rapidly from the retort without producing either pressure or vacuum," the reserve hydrogen gas holder always compensating for the exhaustion. "This invention also affords means of extracting rapidly the first and richest products of the distillation augmented by the poor gas which it will enrich."

[Printed, *sd.* No Drawings.]

A.D. 1860, December 13.—N^o 3066.

EVANS, FREDERICK JOHN, and EVANS, GEORGE FREDERICK.—(*Provisional protection only.*)—"Improvements in the manufacture of illuminating gas."

This invention consists—1. In purifying the gas after condensation, and before the ordinary purification, by mixing with the foul gas atmospheric air or pure oxygen, and then heating the gas to from 200° to 400° Fahrenheit, and passing the same, while so heated, through a purifying vessel, containing charcoal, coke asbetos, chalk asbetos, and spongy platinum, &c., heated to that temperature. During its passage through this purifier the sulphur compounds in the gas appear to be decomposed, and

sulphurous or sulphuric acid is produced, which combines with the ammonia in the gas, or may be passed through a solution of gas so as to be absorbed. 2. In "freeing from its sulphur compounds gas that has already undergone the ordinary process of purification, and which is known as pure gas. For this purpose we use the same means as that above described for treating foul gas, and in some cases we propose to dispense with the use of atmospheric air or oxygen as above mentioned."

[Printed, 4d. No Drawings.]

A.D. 1860, December 26.—N° 3162.

LIZARS, CHARLES.—"Improvements in gas-meters."

"Heretofore in gas-meters various means have been employed for supplying water continuously to the measuring compartment, . . . and the apparatus for this purpose has been actuated by the meter itself; . . . such arrangements are, however, objectionable, as the labour is thrown on the measuring parts of the meter, which should work as freely as possible. Now, according to this invention, the apparatus for supplying water to the measuring compartment is actuated by the cock by which the gas is turned on and off. There is a rod attached by a screw to the plug of the said cock, and the rod descends into the meter through a tube, which at its lower end is sealed by dipping into the water in the meter. The rod gives motion to the lever, at the end of which is a curved rack; this gears with a pinion, so that each time the cock is opened or closed the pinion rotates. On its axis a scoop is fixed, which, rotating with pinion, raises water from a reservoir and pours it into the measuring compartment." Or the same motion may be given to the scoop by the action of the end of the lever on a projection on the scoop.

[Printed, 8d. Drawing.]

A.D. 1860, December 28.—N° 3179.

BINKS, CHRISTOPHER.—(*Provisional protection only.*)—"Improvements in manufacturing certain gases, applicable in generating heat and light, and in bleaching."

The object of the invention is the economical manufacture of chlorine and oxygen. 1. As regards chlorine, it consists in effecting the decomposition of hydrochloric acid, through the agency of oxygen gas, under the conjoint action of a high tem-

perature and the presence of substances capable of retaining or fixing the water formed by the reactions between the oxygen and the hydrogen of the hydrochloric acid, but not capable of retaining or fixing the chlorine, which is thus liberated in its gaseous form. 2. As regards oxygen, the invention consists (1) in effecting the decomposition of water, "free or combined, or in its ordinary form, or in that of steam, or of steam superheated" or otherwise, through the agency of chlorine mixed with or brought in contact with the water or the steam, under (preferably) the conjoint action of a high temperature and the presence of any substance or substances capable of retaining or of fixing, by combination or otherwise, the hydrochloric acid formed by the reactions between the hydrogen of the water and the chlorine, but not capable of retaining or of fixing the oxygen, which is thus set free in its gaseous form." (2.) By "exposing oxides of manganese, preferably the sesqui and the per-oxides, to the action of chlorine, and preferably aiding the reactions between these by means of heat, applied either to the oxide or the chlorine, or to both, thereby forming chloride of manganese, and setting free in its gaseous form the combined oxygen of the oxides." The residual chloride of manganese is then treated for re-oxidation of its metal, according to the inventor's Patent, dated 19th May 1860.

[Printed, 4d. No Drawings.]

1861.

A.D. 1861, January 9.—N° 56.

SHEPARD, EDWARD CLARENCE.—"An improved apparatus for carburating gas for gas lighting."

This invention consists in "causing the gas to come in contact with any proper carburating liquid, such as naphtha, or others, and thereby increasing its lighting power." . . . A float of cork, wood, tin, or other suitable material is placed on the surface of the liquid, and supports an upright tube which is closed at the top; into this tube the gas is led by the supply pipe, which passes up the interior of the tube, so that the gas before passing to the burner is made to play on the surface of the naphtha, &c., and coming in contact with the carburating fluid is rendered

uniform at whatever level the surface of the liquid may be. "Where the carburating liquid is poured into the vessel a piece of fine wire gauze should be inserted directly under the mouth or hole where the liquid is poured in, and a piece of wire gauze should also be placed inside the tube which conducts the gas to the burner, and near to the burner."

[Printed, 6d. Drawing.]

A.D. 1861, January 11.—N° 80.

MORAN, WILLIAM HENRY.—"Improvements in gas-meters."

The plug by which the water is supplied to the meter communicates with a pipe which enters the reservoir. Both the reservoir and supply vessel are furnished with an overflow pipe. On the axis of the drum is a disc, or other suitably formed instrument, with pins or projections which as the drum rotates acts on a bent tail or projection on the axis of a lever scoop, which is heavier on one side of its axis than on the other, so that when released it falls to its lowest position, and its other end comes against and is stopped by a piece of cork or other elastic material. The stem of the lever scoop is tubular, so that when the scoop end is raised above its axis, which is on the edge of the vessel or compartment which communicates with the measuring compartment of the drum, the water descends from the scoop through its stem into such vessel, so as constantly to maintain the same level in the measuring compartment. The index apparatus is in a chamber above the reservoir, so as not to be liable to rust. In addition to the ordinary inlet valve and float, there is a second valve and float, the second float, which is independent in its action, being in a chamber cased off from the other compartment, and arranged to act on a wire, at the upper end of which is the second valve. This wire descends below the valve, and is then bent up towards its under side. The induction pipe enters into the upper compartment of the valve box, which is capable of being closed by the second valve, and the ordinary valve is arranged to close the lower compartment of the valve box.

[Printed, 8d. Drawing.]

A.D. 1861, January 11.—N° 82.

NORMANDY, ALPHONSE RENÉ LE MIRE.—"Improvements in connecting gas and other pipes."

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The pipes are plain, *i.e.*, without sockets, flanges, or projections at their ends. A disc or plate, with a hole in the centre of the same external diameter as the pipes, is slipped on to each of them, the pipes passing through the holes in the discs or plates. A washer or packing ring of vulcanized india-rubber or other suitable material is then slid over the end of each of the pipes, and afterwards over the end of one of the pipes a short length of tube, made just to fit to the exterior of the pipes, is passed. The ends of the pipes to be connected are then butted end to end, and the short exterior tube is slipped along until the ends of the pipes are brought to the centre of it, and the plates (which have annular recesses in them to enclose the washers) are drawn towards each other by screw bolts; the washers by this means are compressed between the plates and the ends of the short tube, and a secure joint is made.

[Printed, &c. Drawing.]

A.D. 1861, January 12.—N° 95.

PRENTISS, ELIJAH FREEMAN. — (*A communication from D. H. Williams.*)—(*Provisional protection only.*)—"Improved apparatus for regulating the flow of gas, part of which is applicable to the valves of steam engines."

This invention is principally applicable where portable or compressed gas is used for illumination. The gas is supplied from the gas holder by a pipe provided with a peculiarly-formed cock to a chamber where the pressure is diminished as required. This cock or valve is constructed on the rotary principle; it is of a conical form, and fits into a correspondingly-shaped seat. A passage is made along the axis of the cock to the centre, where it meets with a transverse passage, which conducts the gas in opposite directions to a chamber outside the cock in the seat. Another transverse passage in the cock, parallel to the former, communicates with an exit passage in line with the axis of the cock and with the entrance passage above mentioned; by this means the gas is made to press equally on both sides of the cock. The seat of the cock is made movable thereon, and is connected by a lever or arm and a rod with a spring box or elastic medium, which is adjusted to a given pressure. Upon gas being admitted through the regulating valve into the chamber, the elastic sides of the spring box collapse, and tend to close the entrance valve or cock until the pressure is reduced, when it again expands and allows

the admission of gas. The interior of the spring box communicates with the air by means of a tube which passes through a stuffing box to prevent the escape of gas from the chamber. The elastic chamber is made with discs of thin sheet brass wound up in a convolute coil, and covered with some elastic air-tight substance.

[Printed, 4d. No Drawings.]

A.D. 1861, January 15.—N° 110.

WILLCOCK, JOSEPH.—(*A communication from John Brunt.*)—*—(Provisional protection only.)*—"Improvements in gas regulators."

This invention applies to ordinary regulators, wherein the inlet gas, admitted at varying pressures, is caused to flow from the said regulators at a more regular pressure by the action of the outlet gas on a bell suspended freely in a water reservoir, and to which is appended the regulating cone in the centre of the inlet orifice, which, being diminished by the rising of the bell and cone, diminishes the pressure, and *vice versa*. This invention consists in applying to the ordinary cone a new species of valves, so arranged that the varying pressure of the gas can have no injurious effect on their working, and the gas is caused to come laterally in contact with them, and not on their under surface. One description of valve for this purpose consists of a short hollow cylinder rising and falling between two stationary rings or flanges forming part of the inlet chamber, the regulation in the pressure of the gas being effected by its passage between the top of the said cylindrical valve and the upper ring of the inlet chamber, and it afterwards passes through an outlet chamber to the outlet pipe, either by flowing above the valve or through it. Another consists of a longer hollow cylinder open throughout, the upper face of which regulates the pressure of the outlet gas by its action against a stationary ring forming part of the inlet chamber, whilst its lower extremity is sealed in water, the outlet gas having constant access to the interior of the cylinder by the top opening so long as the regulator is working.

[Printed, 4d. No Drawings.]

A.D. 1861, January 17.—N° 135.

CLARK, WILLIAM.—(*A communication from Pierre Léon St Clair.*)—"Improved apparatus for raising fluids."

This invention relates to a new system of machinery for raising water by utilizing the different levels obtained in vessels communicating with each other, containing fluids of different densities, as, for example, water and mercury, and is applicable to various purposes, among others, to rarifying liquids and gases. The apparatus consists of a vessel with one high and one short branch of communication. The higher branch has at its lower part a suction pipe communicating with the liquid to be raised. The higher branch may discharge its contents into a reservoir, at its upper part. The higher branch and suction pipe are both furnished with stop valves. The lower part or branch of the vessel is filled with mercury, and the higher branch with water. Equilibrium is established between the liquids by reason of their different densities. "Thus, if a displacing body be introduced into the mercury in the shorter branch it will have the effect of raising its level, and, as a consequence, the water in the higher branch will be raised, and part of the contents discharged into the reservoir. The displacing body, when elevated from the mercury, will produce a fall of the same, but the elevated liquid will be retained by means of the upper valve and suction produced in the suction tube, in which water or other fluid ascends and enters the higher branch."

[Printed, *8d.* Drawing.]

A.D. 1861, January 22.—N° 167.

SIEMENS, CHARLES WILLIAM, and SIEMENS, FREDERICK.
—"Improvements in furnaces."

This improvements consist in decomposing the solid fuel in a separate vessel, so that the gaseous fuel may be heated to a high degree prior to its entering into combustion with atmospheric air, also heated to a high degree, "thus causing a great economy of fuel." In order to equalize the pressure of the gases and atmospheric air in the furnaces, four generators are arranged below the bed of the furnace, two of which serve to communicate heat separately to the combustible gases and atmospheric air on their way to the furnace, and the remaining two to absorb the waste heat from the products of combustion, "passing through them indiscriminately before reaching the chimney (their respective action being reversed at intervals), the currents of heated gas and air in ascending through and from the regenerators into

" the furnace causing a plenum of pressure within the same, " which is capable of being modified or regulated by valves for " the admission of the gas and air to the generators, and by the " chimney damper." The improvements in gas generators consist in allowing the hot gases to ascend from the generators and descend again after they have been partially cooled by the exposure to the atmosphere of the pipes containing them. The decomposition of carbon is moreover avoided by the introduction into the generators or channels leading from the same of streamlets of water or of steam, which, in combining with the heated portions of solid carbon, form with the same permanent combustible gases, viz., carbonic oxide and hydrogen. " If several generators are provided, we prefer to lead the gases produced by " them into a main channel, which may be arranged to supply " several furnaces, the advantage of this arrangement being " that a greater uniformity in quantity and quality of the gas is " obtained."

[Printed, 1s. 6d. Drawings.]

A.D. 1861, January 28.—N° 221.

HART, HERBERT WILLIAM.—(*Provisional protection only.*)—
" Improvements in gas-burners."

This invention relates to Argand burners. Below the point of the burner at which the gas is ignited an annular chamber is formed, in which felt or other permeable material is placed. In order that there shall be no obstruction to the gas after it has permeated this material, the gas, instead of passing through small holes, passes through an annular orifice. A semicircular cup, open at the top and placed on a rod passing through the flame, gives a uniform shape to the flame. The glass chimney is made to correspond in shape with the flame, and the globe cut away at the top to admit the chimney. To improve the combustion of the gas a piece of metal is bent downwards at the top of the chimney so as to contract the opening. On the top of this piece is an ornamental bell-mouthed cap, to which a reflector or shade may be fixed at pleasure. A short glass chimney is applied round the burner to prevent the air striking the flame at the point of ignition. This chimney is of slightly larger diameter than the burner and its top projects a short distance above the point of the burner at which the gas is ignited. The exterior of this short

glass chimney is a short distance from the interior of the large chimney, so that air can pass between them to the flame, and at the lower part of the burner, at which point air passes both to the interior and exterior of the flame, is applied a cup of glass to protect the burner from currents of air, a small space being left between the cup and the glass globe for the passage of air."

[Printed, 4d. No Drawings.]

A.D. 1861, February 11.—N° 348.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Pierre Duchamp.*)—(*Provisional protection only.*)—"An improved "gas apparatus, intended chiefly for lighting pipes, cigars, and "cigarettes."

A holder, which can be grasped in the hand supports a burner, the passage to which is provided with a key which extends in the form of a hollow bent tube, and terminates in the mouth of a flexible tube in communication with a gas supply pipe. A screw in the centre of the holder regulates the extent to which the key may be opened. The passage of gas to the burner cannot be wholly shut off, and the minimum supply is maintained while the holder is at rest, but by simply holding it up, the key turns in its seat and increases the supply, and consequently the flame. The burner is surrounded by a gallery for holding a chimney, which is lower on one side than the other, to afford facility for lighting a cigar, &c.

[Printed, 4d. No Drawings.]

A.D. 1861, February 21.—N° 427.

MASCHWITZ, CHARLES.—(*A communication from Joseph Berger.*)—(*Provisional protection only.*)—"A new or improved "tap or stop-cock for liquids, steam, and gas."

On the under side of the horizontal body of the tap is an opening to which the following parts are affixed:—"To the said opening is screwed a vertical cylindrical piece having on its axis a small cylindrical hole, and on one side of and parallel with the hole a nearly semi-cylindrical passage. On the top of the cylindrical piece is a cap or plate fixed on an axis passing through the small hole in the cylindrical piece. The cap or plate has an opening corresponding with that in the cylindrical piece, and may be turned so as to make the two openings coincide. The plate and

top of the cylindrical piece are made to fit a circular rim on the top of the latter, working in a groove in the former. The lower end of the axis of the cap is fixed in a rotating piece working on the lower part of the cylindrical piece. The lower part of this rotating piece constitutes the delivery pipe of the tap or stop-cock, and the axis of the cap or plate is fixed in a diaphragm extending across the interior of the rotating piece. This diaphragm is perforated with an opening of the same size and shape as that in the cap or plate, and when the rotating piece is turned so that the holes in the cap or plate, and in the cylindrical piece, and in the diaphragm of the rotating piece into the same line, liquids, &c., can pass through; in the other events it is stopped. The rotating piece is provided with thumb plates, and is secured to the cylindrical piece by pins on the latter engaging in a groove on the inside of the rotating piece.

[Printed, 4d. No Drawings.]

A.D. 1861, March 9.—N° 593.

JACOB, JOSEPH.—(*A communication from Carl Preisenhammer and Carl Weniger.*)—"Improvements in the mode of, and apparatus for obtaining gas, and the application thereof for domestic, manufacturing, and other purposes."

This invention relates to the production of pure hydrogen gas. "One method of producing this gas, which has hitherto been only demonstrated experimentally in the laboratory, consists in passing steam through a tube or pipe which contains small quantities of iron in the form of borings or filings." The steam in practice is sent through a series of retorts filled with the filings and heated to a red heat; the hydrogen gas liberated is conducted by pipes into a receiver or holder. After a sufficient supply of hydrogen gas has once been produced, it is intended to use the same both under the retorts and under the steam boilers, in place of or together with other kinds of fuel. Where great intensity of heat is required, the gas is used in combination with atmospheric air, both under a certain artificial pressure, each passing through a distinct pipe to a common burner. Oxygen, or a combination of oxygen gas with atmospheric air, may be burnt with the hydrogen gas. When used for illuminating purposes, the flame from the compressed hydrogen gas and air, or hydrogen gas and oxygen gas, or hydrogen gas and oxygen gas

mixed with air, is brought in contact with a solid body, such as chalk, to produce brilliancy.

[Printed, 4d. No Drawings.]

A.D. 1861, March 14.—N° 635.

SIMMONS, GEORGE.—“Improvements in apparatus for making connections with gas and water mains.”

To prevent the escape of water and gas, wherever a connection is made with a main, a hollow box or cover is used, which is open at the lower part, but which is yet capable of being rendered gas and water tight where it is placed on a main, and when it is fixed thereto; at the upper part of such hollow box or cover is a slide or moving part, which is capable of being moved a distance after a hole has been drilled through the main, in order to bring a screw-tap into position to tap the hole so made with a screw thread. Or the drill and screw-tap are combined so that the latter may come into action when the drill has passed through into the main “in a somewhat similar manner to that in which a drill and screw-tap have before been combined.” The upper moving or sliding part is also capable of being again moved, so as to bring into position a short length of tubing, previously tapped at its lower end with a male screw to correspond with the screw formed in the main, as above explained. The upper movable or sliding part has through it three openings when the drill and screw-tap are separate instruments, one opening is for the passage of the drill, another for the passage of the screw-tap, and the third for the passage of the short length of tubing, which, as before stated, is screwed at its lower end, and capped or plugged at its outer end; provision is made to render the three passages gas and water tight, and yet admit of the drill, the screw-tap and the short length of tubing being turned round. When the drill and the tap are combined only two passages will be required.

[Printed, 10d. Drawing.]

A.D. 1861, March 15.—N° 650.

LORBERG, WILLIAM.—“An improved process for obtaining and utilizing the chemical products of spent bark (commonly called ‘tan’) and all other woody fibre; also improved apparatus to be employed therefor.”

This invention consists in subjecting these matters to dry or destructive distillation at certain temperatures. The products of

this distillation are charcoal, tar, and other oily matters, acid, and gas. The tar is subjected to certain processes for the purpose of obtaining its various constituents, such as paraffine, kreosote, naphtha, &c. The acid may be obtained from the liquid in the usual way, or in improved apparatus of the following construction:—A metal vessel of suitable dimensions is fixed to a conduit pipe situate between a furnace and a condenser. This vessel is filled with alkali, which combines with the acid as it passes through the same without condensing much of the watery vapour, and by these means the acid is neutralized in an almost saturated condition without any additional trouble. “The gas given off consists principally of hydrogen and carbonic oxide, and therefore constitutes an excellent source of heat, which I propose to employ for heating the whole apparatus. I would observe that the aforesaid gas, by the use of very simple means, can be made to burn with a luminous flame, and thus be rendered applicable to illuminating purposes.”

[Printed, *sd.* Drawing.]

A.D. 1861, March 15.—N° 652.

TRACHSEL, FREDERICK, and CLAYTON, THOMAS.—“Improvements in the manufacture of gas and in the apparatus employed therein.”

This invention consists—1. In the use of air, hydrogen gas, carbonic oxide, or other non-luminous gases in combination with, or impregnated by, volatile solids and fluids, so as to render the same luminous. The solids and fluids used are camphor, ether, alcohol, turpentine, camphine, and other essential oils, wood spirits, coal naphtha, oils of wood, oils of tar, paraffine oils, petroleum, caoutchine, and other similar substances, rectified by distillation at any heat below 212° . To produce a gas suitable for heating hollow rollers, singeing textile fabrics, or other similar purposes, the retort is charged with scrap iron or charcoal for the decomposition of steam, which is regulated by a self-acting apparatus on the principle of a float acting on a valve. This non-luminous gas can also be produced by the action of acids, water, and any corrodible metals. The impregnating apparatus consists of a vessel, box, or a series of boxes of iron, copper, brass, tinned plate, zinc, earthenware, china, glass, &c., with partitions filled with sponges or coke pumice stone to scatter the air over a large area. The air-blowing machinery is composed of a train of wheel-

work with cranks or excentrics actuating bellows or fans, and set in motion by the retractile force of a number of vulcanized rubber springs; when wound up it is put in connection with the drying and impregnating boxes or vessels, and light is obtained and maintained as long as the supply of air lasts.

[Printed, 10*d*. Drawing.]

A.D. 1861, March 16.—N° 663.

TAYLOR, JOHN INGHAM.—“Improvements in apparatus for
“ the manufacture of gas from coal, oil, or oleaginous substances,
“ and other purposes.”

This invention is mainly an improvement on No. 730, A.D. 1860 and consists in inserting one or more diaphragms within the retort containing the oil or other material in order to extend the heating surface, and also the travel of the gas through the retort for the purpose of drying or desiccating the gas. “I apply, in combination with the furnace for generating the gas, a water tank or
“ a series of pipes, which tank or set of pipes receives the heat of
“ the furnace that would otherwise go to waste, and supplies heated
“ water for domestic or other uses; this I call the first ‘supplementary application.’ I also apply, in combination with the
“ furnace, one or more ovens or drying chambers, by which the
“ waste heat is further utilized; this I call the second supplementary application. The gas apparatus may be constructed or
“ used by itself, or in combination with one or both of my
“ supplementary applications.”

[Printed, 10*d*. Drawing.]

A.D. 1861, March 18.—N° 681.

HENRY, MICHAEL.—(*A communication from Edouard Alphonse Jardin and Alfred Charles Marie Celestin Edgard Goussard.*)—

“Improvements in furnaces in which combustion is carried on
“ for obtaining gases or gaseous products to be usefully applied.”

The gases are formed in a chamber called the “gasifying space.” The grate or set of fire-bars, instead of lying within or close against the gasifying space, is fitted sufficiently away from and below it so that a space is left between such grate and the bottom of the gasifying space for air to circulate around the fuel. The sides of the gasifying space, instead of being rivetted and furnished with a lower connecting frame, as in the Luzarche or Beaufumé

arrangements, is rolled, hammered, or beaten metal, wholly or nearly without rivetting-joints, seams, or such like connections. The internal shell or skin of the gasifying space is turned back at the bottom or bent out so as to form a lip, and thus remove it from the intense action of the heat, and at the same time leave the air space before referred to. To keep the sides of the gasifying space properly cool they are surrounded by a casing supplied with water. At the lower part of this water space are formed one or more door springs or holes for access to the water casing and for the removal of deposits.

[Printed, 10d. Drawings.]

A.D. 1861, March 21.—N° 707.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from A. Massey, G. Jullien and E. Jullien.*)—"Improvements in " gas stop-cocks."

This invention mainly consists in a peculiar application of valves to gas stop-cocks, by means of which, combined with certain modifications in the general construction, all escape of gas is prevented even during cleaning.

One combination, represented in the Drawings, consists of an ordinary barrel and a second barrel of larger diameter, in which is lodged a valve constantly pressed by a spring against the bottom of the first barrel. A hollow plug with an orifice gives passage to the gas through an outlet pipe. When this plug is set in position, its hind extremity, which is longer than the ordinary barrel, displaces the valve, compressing the spring and allowing the gas to pass to the interior. When the orifice is brought into communication with the outlet pipe the gas passes; when the plug is turned half-way the outlet pipe is closed by the plain surface, and the supply of gas shut off. When the plug requires to be withdrawn, the valve acted on by the spring covers the opening of the first barrel, which it closes hermetically, thus completely intercepting the flow of gas.

[Printed, 10d. Drawings.]

A.D. 1861, March 25.—N° 749.

BROOKES, WILLIAM.—(*A communication from William Richards.*)—"Improvements in means or apparatus for measuring gas."

This invention consists—1. In making the float in wet meters rise and fall with the water surrounding the wheel. A separate compartment for the float is by a suitable opening in communication with the chamber for the measuring wheel, and this float compartment opens through the valve in connection with the float into a chamber with a passage to the outlet. 2. In applying that description of measuring apparatus in which the measuring wheel or series of compartments rotates or undulates at an inclination to the horizon, rotary or slide valves, for the conveyance of the gas to and from the various chambers, the seat of the valve being attached to the wheel. In the rotary motion the cover is maintained in the same position by suitable studs attached to the upper support for the bearing of the axle, so that the cover remains still, whilst the seat of the valve revolves, thus admitting of the ingress and egress of gas. When slide valves are used the excentric is employed in like manner to the support of the bearing of the shaft, so with suitable rods the wheel in motion changes the position of the valves. In the undulating motion the cover of the valve is caused to rotate by studs on the crank, or the excentric is placed of the crank to give motion to the slide valves. 3. In the application of metal hinges to the parts of movable metal diaphragms for dry meters, composed of one or several pieces, so constructed that the flexible material shall be in loose folds, and so arranged as to prevent strain on it.

[Printed, 1s. Drawings.]

A.D. 1861, March 27.—N^o 769.

WILLANS, JACOB GEOGHEGAN.—“Improvements in the
“preparation of hydrated oxide of iron, and the application of
“such prepared oxides for the absorption or separation of sulphur
“from certain gases.”

This invention consists—1. In preparing hydrated oxide of iron from such iron ores as are hydrated oxides, by crushing or grinding the ores and separating the fine particles from the coarse “by means of water or other fluid, or by a current of air or other gaseous matter, or by such apparatus as is commonly used for sifting wheaten flour,” and employing the oxide so prepared in the purification of coal gas from sulphur, or for absorbing or collecting sulphur from sulphuretted hydrogen gas given off from substances containing sulphur whilst undergoing decomposition

or chemical action. 2. In the preparation of oxide, which will be hydrated from ores of iron containing oxygen which are not hydrated oxides, or from ores of iron containing hydrated oxide, also from materials rich in iron, such as burnt pyrites or cinder produced at iron works or smelting works, or hammer slag, or similar scaly particles formed during the process of hammering or rolling iron or steel. This is effected by acting upon any of the above, at or above a red heat, with carbon or other deodorising agent, and afterwards exposing the same to the influence of air and moisture, or other oxidizing or hydrated influences. 3. In employing the hydrated oxides so obtained for the same purposes to which the natural hydrated oxide is applied as above stated.

[Printed, 4d. No Drawings.]

A.D. 1861, April 5.—N° 839.

BROWN, DAVID, FELLOWS, NOAH, JONES, EDWARD, and BROWN, WILLIAM.—“Improvements in the manufacture of “nails, railway spikes or pins, and gas tube fastenings, and in “machinery employed in the said manufacture.”

The invention consists in rolling bars of iron of such figures that when cut transversely they have in section the figures of headed nails, railway spikes or pins, and gas tube fastenings.

[Printed, 10d. Drawing.]

A.D. 1861, April 16.—N° 931.

GIPOULOUX, PIERRE.—“An improved cooking stove.”

On each side of the fire-place are two gas retorts, and the flues from the fire-grate are arranged in such a manner that the flame and heated air from the fire in the grate are divided into two branches, and pass over the top of the retorts, and descend on the other side thereof, which are thus heated. The flame and heated air in one of the branch flues in descending also heats a boiler, and that in the other flue heats a bain-marie, the boiler and bain-marie being placed at the further sides of the retort, with the vertical descending flues between them and the retorts; the flame and heated air descending by these flues comes on to the top of two baking ovens. The two branches of the flue then unite, and pass out at the back of the stove to the chimney. The gas produced in the retorts is passed through water in order to con-

dense the tar and other impurities, which are drawn off by a stop-cock. It is then passed through a purifier, and thence to a gasometer to be supplied to the burners. The coke drawn from the gas retorts serves to supply the fire-grate, which is charged with a hole, fitted with a cover, at the top of the stove. The fire-grate is closed in front, and has an ash-pit beneath. The doors of the gas retorts are at the front of the stove, and are removed to withdraw the coke and recharge the retorts.

[Printed, *ed.* Drawing.]

A.D. 1861, April 17.—N^o 946.

DUCKHAM, HENRY ALEXANDER FREDERICK.—(*Provisional protection only.*)—"Improvements in gas-meters and regulators, " and in compounding materials to be used as a coating for or " in the composition of substances subject to the action of gas."

The invention consists—1. In the substitution of slide valves for the lift or clack valves usually employed in regulators. 2. In the use of glass, pebbles, glazed ware, or other non-adhesive material as the materials for the valves in gas regulators and meters. 3. In the application of a float to the reservoirs or self-acting supply cisterns of gas-meters and regulators to shut off the passage of gas through the meter before the cistern is empty, and so suspend the action of the meter. 4. In the application of a supply tube from the fluid reservoir, which, by interrupting the action of the meter, if tilted forward, prevents tampering; as also the application of a pipe from the dry well, which is carried round the extremity of the drum towards the back of the meter, is bent upwards a little above the water level, and down again, so as to dip two or three inches, such dipping end being open when the meter is tilted. 5. In "the combination generally of dry gas-meters with dry gas regulators, and wet gas-meters with wet gas regulators, or it may be dry gas regulators with wet gas-meters, " or *vice versa*, in the one and the same machine or case. 6. In "the application of a composition, composed of gelatine and " treacle, or other non-crystallizable saccharine matter, in about " equal parts, and a small proportion of alum, to metallic or other " surfaces generally subject to the action of gas, in order to their " preservation."

[Printed, *4d.* No Drawings.]

A.D. 1861, April 18.—N° 948.

CARSTANJEN, HUGO.—(*Provisional protection only.*)—"Improvements in the apparatus for, and method of, increasing the illuminating power of gas."

This invention consists in exposing the gas to the action of benzoine in a chamber of novel construction. The chamber is divided by a horizontal diaphragm fitted in the lower portion thereof, the upper and lower compartments communicating by tubes or sheet spaces. Through the series of tubes or sheet spaces cotton or other wicks are drawn, so as to cause the benzoine to pass upwards by capillary attraction. The benzoine passes from a reservoir, attached to the apparatus, into the lower compartment. The gas enters by a pipe at one side of the upper compartment of the apparatus, and is discharged under regulation by a pipe at the other. "By making a junction piece or circuit pipe between the inlet and outlet pipes, and inserting cocks or taps in such position as the supply of gas may be shut off from the apparatus, and be caused to pass direct to the delivery side instead of through the apparatus, the gas may be consumed without being impregnated or charged with the benzoine, or, subject to regulation, it may be passed only through the apparatus, according to my invention, and any lesser degree of illuminating power than that which the apparatus is capable of effecting may be imparted to the gas on its way to the burners, and thus the advantages belonging to the use or employment of my said invention may be demonstrated."

[Printed, 4d. No Drawings.]

A.D. 1861, April 20.—N° 979.

PINCHBECK, JAMES.—"Improvements in wet gas-meters."

This invention relates principally to the mode of preventing the pressure of the inlet gas shutting down the valve, in order that the valve may be adjusted to the greatest nicety and close when the level of the water in the meter falls by evaporation or other wise. "The gas from the inlet valve enters the chamber containing the measuring drum through an aperture or valve made in the round front or partition dividing the square front and the compartment containing the measuring wheel. The gas then enters the measuring drum at the back and into the

“ syphon pipe in the reverse direction of that in ordinary meters,
“ and no direct communication exists between the syphon pipe
“ and the square front. From the syphon pipe the gas enters
“ into the waste water box below the square front, and thence by
“ a pipe to the outlet. The water level in the meter is adjusted
“ by a pipe, the upper extremity deciding the height of the
“ water, and entering the waste water box at the lower extremity,
“ a hydraulic seal being made on one or more intervening bends,
“ as may be found desirable. To prevent tilting, a lever valve
“ may be adopted to the aperture or valve in the round front.
“ As the gas in the waste water box is measured or registered,
“ gas fraud by the extraction thence of gas is avoided.”

[Printed, 8d. Drawing.]

A.D. 1861, April 20.—N^o 983.

WEBSTER, JAMES.—(*Provisional protection only.*)—“ Improve-
“ ments in manufacturing oxygen gas and obtaining certain other
“ products.”

This invention consists of a mode of treating a mixture of nitrate of soda or other nitrate with an oxide of iron for the purposes of obtaining oxygen gas, nitrogenous compounds, and the base of the salt employed. The mixture is distilled in a retort. The nitrogenous compounds contained in the gaseous products of the distillation are separated by condensation from the residue of those products, consisting chiefly of oxygen gas, which is collected in a receiver. The residuum in the retort is the base of the salt employed, and if it be an alkali or alkaline earth it will be in a caustic state.

[Printed, 4d. No Drawings.]

A.D. 1861, April 23.—N^o 1008.

RICHARDSON, THOMAS.—(*Provisional protection only.*)—
“ Improvements in the purification of coal gas.”

This invention consists “in reducing the impure oxide of iron,
“ which is a waste product when sulphur ores are used for the
“ manufacture of sulphuric acid, by means of hydrogen, carbonic
“ oxide, or other deodorizing gases, and in employing the result-
“ ing material in purifying coal gas; or in exposing the above
“ material so obtained, moistened with water or with water con-
“ taining small quantities of muriatic or sulphuric acid, and in

"employing the resulting material in purifying coal gas, or in mixing any of the above compounds with slacked lime, ground gypsum, or rough Epsoms, with or without sawdust or other porous materials, and in the employment of such materials in purifying coal gas; or in mixing the impure waste oxide of iron, or the material obtained by its reduction as above explained, with sawdust or other porous substances, saturated with a solution of muriate of manganese, iron, lime, or magnesia, and in employing such mixtures in purifying coal gas."

[Printed, 4d. No Drawings.]

A.D. 1861, April 26.—N^o 1052.

COWAN, WILLIAM.—(*Provisional protection only.*)—"Improvements in gas-meters."

The object of this invention, which is applicable to dry and wet meters, is to admit of the indicating mechanism being stamped or sealed by the inspector, so as to make any tampering with it evident at once.

The drum shaft of an ordinary meter has on its front extremity an excentric, giving a vertical oscillating movement to the rod working the indicating mechanism. This rod "passes up through the usual pendent seal tube into the index box." Its lower end is curved upwards (so as to bring the mouth of the seal tube below the water line), and then in a horizontal direction, which part rests upon the drum shaft excentric, and it has a vertical wire soldered to it which passes through a guide eye above. The upper end of the rod is a flag wire, which, as it rises and falls, gives motion by means of a projection on it to a pallet with duplex detents, which alternately take into the teeth of a crown or ratchet wheel, the spindle of which is carried in the front part of the index frame, and in a supplementary bearing piece screwed to the front of the main frame. The outer screw of this piece also secures a cupped disc to receive the inspector's seal. The spindle of the crown wheel is of pinion wire, the levers of which give motion to the ordinary train of indicating mechanism, thus, whether the drum is moved backwards or forwards, the motion of the indicating mechanism is always forward. Another mode of arranging the drum shaft, in lieu of the excentric, is to form the front end of the shaft with a crank, the pin of which passes

through an eye formed for the purpose in the end of the rod which actuates the flag wire.

[Printed, 4d. No Drawings.]

A.D. 1861, April 27.—N° 1070.

NEWTON, WILLIAM EDWARD.—(*A communication from William Benjamin.*)—(*Provisional protection only.*)—"An improvement in "gas-burners."

The invention consists in applying to the burner a valve, which regulates the pressure of the gas to the exit aperture. The burner is divided into two parts, between which is placed a cylindrical chamber, called the valve chamber. To the upper part of this chamber is secured a vertical tube, open at both ends, and provided with a seat to receive a weight, which is lifted in the tube as the valve below rises. The valve consists of a cylindrical tube provided at its upper end with a conical projecting piece, which is inserted in the lower end of the tube at the top of the valve chamber. This conical projecting piece is made of a slightly elliptical form, so as to leave spaces between it and the tube for the passage of the gas. As the gas enters the burner it forces up the cylindrical valve to a greater or less height according to the pressure, and the valve as it rises lifts up the weight and restricts or contracts the passages. In the upper part of the burner is placed a disc of perforated metal or wire-cloth for the purpose of distributing the gas.

[Printed, 4d. No Drawings.]

A.D. 1861, May 2.—N° 1104.

DAVIES, GEORGE.—(*A communication from Hubert Bosch.*)—(*Provisional protection only.*)—"Improvements in gas-burners."

The object of the invention is to increase the illuminating power and economize the consumption of gas. The ordinary gas-burner is "covered with a metallic nipple or capsule, in which the "gas expands before arriving at the extremity thereof. By these "means the gas (not becoming carbonized as in the case of the "ordinary burners) arrives without pressure at the extremity of "the nipple or capsule, where it passes through one or more "openings, and burns with a much brighter light, effecting an "economy of 40 to 50 per cent. . . . Instead of placing these

" nipples or capsules over the ordinary burners, a burner producing the same effect may be formed in one piece by the use of a perforated division, leaving a chamber for the gas to expand in before it arrives at the orifice where it is burnt."

[Printed, 4d. No Drawings.]

A.D. 1861, May 7.—N^o 1152.

GEDGE, WILLIAM EDWARD.—(*A communication from Charles Douchain.*)—" Improved means and apparatus for conducting or forcing the flow of water."

This invention consists—1. In a double-action vent trap for cleansing waterconduits. 2. Of a box or apparatus placed beneath the pavements of the streets for washing or watering, or in case of fire. 3. In "screw fastenings for traps, plugs, and openings of every description, water, gas, drain, or other." A metallic piece carries two claws or arms, between which passes the conical end of a screw working in a metal nut in one piece with the metallic piece, so that when the screw is not tightened the distance of the claws apart permits the metallic piece to enter the mortice of the plug; thus, if the screw be tightened, the claws forced apart by the conical part press upon the sides of the mortice; by loosening the screw the plug opens. A simplified arrangement is shown for orifices with key plates, and also for plugs of small dimensions.

[Printed, 1s. 8d. Drawings.]

A.D. 1861, May 13.—N^o 1207.

PULS, FRANCIS.—"A mode of preparing an oxidizing agent."

This invention consists of a mode of rendering oxygen gas more active as an oxidizing agent. For this purpose oxygen, either alone or with any other gas which will not neutralize its action as an oxidizing agent, is passed in contact with liquid sulphuric acid. Either the acid or the gas should be heated during this process. "Atmospheric air may be treated in this manner for the purpose of rendering the oxygen which it contains more active as an oxidizing agent. Any apparatus or process may be employed for the purposes of my invention, which will cause every part of the gas operated upon to be brought into contact with and subject to the action of the acid.

[Printed, 4d. No Drawings]

A.D. 1861, May 15.—N° 1236.

CLARK, WILLIAM.—(*A communication from Emil Heischhauer.*)—(*Provisional protection only.*)—"Improvements in gas regulators."

Two stop-cocks are placed in the gas channel near the burner, the outlet (that nearest the burner) having about half the area of passage of the inlet. The gas channels do not pass directly through the stem, but pass out at the sides and admit the gas to a flexible chamber secured on the exterior of the stem on which the cocks are fitted, and expanding and contracting with the pressure of the gas entering. Each of the cocks is furnished with a lever arm bearing on the chamber and springs which open the cocks when the pressure within the chamber is removed. A stop prevents the outlet cock being entirely closed. A small reservoir between the burner and the nearest stop-cock reduces the flickering to a minimum. "I arrange a further regulation of the quantity of gas to be passed by an index hand, which communicates with a second plug of the exit stop-cock, which also regulates the area of its passage. The two plugs of this cock are concentric, the arm of one plug being at one end of the axis, while the index hand is fixed on the opposite end, which is carried outside the case or is otherwise visible and adjustable by hand."

[Printed, 4d. No Drawings.]

A.D. 1861, May 18.—N° 1268.

BENNETT, WILLIAM HENRY.—(*A communication from Edouard Servier.*)—"Improvements in apparatus for regulating the supply of gas."

The object of this invention is to maintain a uniform pressure of gas at any given point of the distributing mains or pipes of a gaswork, or in the gas fittings of a house or factory, by means of a self-acting apparatus fixed between that point and the source of supply. The apparatus consists of a regulator with an inverted annular bell, the mouth of which is immersed in a liquid, and from the centre of which a cone is hung whereby, as the bell rises or falls, the opening into the exit pipe is diminished or increased. A small pipe rising above the surface of the liquid of the outer ring of the inverted bell is carried to the point in the distributing mains or pipes where a uniform pressure is desired. "The effect

“ of maintaining a uniform pressure in the outer ring of the
“ inverted bell is so to regulate the pressure of the gas in the exit
“ pipe as to maintain that uniform pressure in the distributing
“ mains and pipes at the point required.”

[Printed, 6d. Drawing.]

A.D. 1861, May 18.—N° 1269.

PONTON, ARCHIBALD CAMPBELL.—(*Provisional protection only.*)—“ Combining together siliceous powder into solid masses
“ of any form by means of sulphur, and which combination I call
“ siliceous stoneware.”

Among other uses of the stoneware are gas pipes. It is composed of “ ground flints, ground quartz, or Lynn sand, or Tripoli,
“ or siliceous powder from any other source, and as much melted
“ sulphur as is necessary to unite the siliceous particles. Any
“ colouring matter may be added. The silica powder is added
“ gradually to the melted sulphur and intimately mixed with it;
“ when still hot, and in its fluid or plastic state, it can be brushed
“ or spread upon surfaces, run or pressed into moulds or dies,
“ rolled into plates, or coat any substance immersed into and
“ then withdrawn from it.”

[Printed, 4d. No Drawings.]

A.D. 1861, May 29.—N° 1343.

CHING, COMYN.—(*Provisional protection only.*)—“ Improve-
“ ments in gas chandeliers.”

1. In the case of telescopic chandeliers, “ by dispensing with the
“ ordinary unsightly balance weights, I propose placing on each
“ side of the gas pipe, suspended from the ceiling and near to it,
“ a toothed wheel, each of different diameters, and at or near the
“ top of the lower and outer tubing is placed a similar wheel. . . .
“ The endless chain which bites the teeth on these wheels is passed
“ over the top large wheel, and falls under the bottom wheel, when
“ it is again raised in the same direction, and passes over the
“ second or similar wheel, the lower or unemployed part of the
“ chain resting in an ornamental tray or dish under the inverted
“ T-piece. The chain now being in gear with all three wheels, it is
“ evident that the weight of the chain will allow of the chandelier
“ being raised or lowered to the required height,” and there
remaining, the wheels being hidden by “ any suitable metal orna-

ment." 2. To prevent escape of the gas from the telescopic tubes, "I propose to employ an ordinary stuffing box, and above it a cup forming part of the ornament before mentioned, in which is placed a suitable non-evaporating fluid. A cup is also attached to the bottom of the upper pipe, said cup having incisions or perforations on the upper part, the end of the pipe being within the cup, so that should there be any imperfection in the packing, instead of the gas escaping, the liquid will pass the stuffing and run down the outer surface of the inner pipe into the cup, which when not quite full will touch the bottom of the pipe and instantly extinguish the gas."

[Printed, 4d. No Drawings.]

A.D. 1861, May 30.—N° 1350.

JOHNSON, JOHN HENRY. — (*A communication from Henri Girond.*)—"Improvements in apparatus for regulating the pressure of gas."

This invention consists in the use of two separate apparatus working in conjunction, the one placed in some central position in the locality supplied by the works, the other in the place where the gas is manufactured. The first consists of a float or pressure gauge or indicator, the needles of which are so constructed that one of their branches dips into one or other of two vessels containing mercury, or establishes in any equivalent manner an electric contact whenever the pressure differs from the desired amount. "Two conducting wires connected severally to the vessels of mercury or contact surfaces, as the case may be, extend to the gas-works, and the needle of the indicator being in communication with one of the poles of a battery, the other pole of which is in connection with earth, it follows that, each time that pressure varies, one of the branches of the needles establishes an electric communication with the gas-works. The second piece of apparatus, placed at the gas-works, consists of a hydraulic valve or regulator placed on the mouth of the main which conducts the gas from the gas holder; such valve being opened or closed by an arrangement of wheelwork actuated by a weight and double gearing. Two electro-magnets attached one to each wire are so adjusted in the apparatus as to act upon the starting or reversing lever of the wheelwork, and according as one or the other of these magnets is excited the lever will be

" brought into two opposite positions, or will remain in a central position when both magnets are unexcited, and the valve will be either elevated, depressed, or held stationary accordingly. By a slight modification of the pressure indicator it may be transformed into a commutator, in which case one conducting wire in place of two would be required."

[Printed, 1s. 2d. Drawings.]

A.D. 1861, May 31.—N° 1365.

GLOVER, GEORGE.—(*Provisional protection only.*)—"Improvements in gas-meters and pneumatometers."

"To construct the registering apparatus of these with facility, I form each of the side frames, which receive and bear the ends of the axes of the train of wheels, of an irregular form with projections thereon to receive . . . the several ends of the axes of the wheels each projection being of such substance and form that it may readily be bent and set in the desired position, in place of, as heretofore, making the side frames of plates or other forms having holes in them to receive and bear the ends of the axes of the wheels. . . . "The side framings are composed of an alloy of tin and antimony, which resists the action of the coal gas and diminishes friction. For convenience in adjusting the position of the pin, by which the action of the link or connecting rod communicates motion to the slide valve of a dry gas-meter or pneumatometer," I attach such valve pin by means of a projecting lug on the valve, the lug being formed with a slot through it, and the pin is formed with a screw and nut by which it is readily slid along the lug to a correct position, and there secured by the nut. To adjust the crank or tangent pin for accurate measurement, the crank is formed with a slot and the pin fixed therein "by a screw and nut, in like manner, to the valve pin above mentioned."

[Printed, 4d. No Drawings.]

A.D. 1861, June 4.—N° 1397.

PRINCE, ALEXANDER.—(*A communication from Messieurs Schaeffer and Walcker.*)—"Improvements in the manufacture of gas and in the apparatus connected therewith."

This invention is "founded on the fact that steam in the presence of carburetted hydrogen substances conducted over glow-

“ing coals decomposes itself so that it produces a clear luminous
“gas in larger quantity and better quality than the hydrocar-
“buretted substances would produce if alone decomposed. The
“steam thus decomposed with the red-hot coal forms hydrogen
“and carbonic oxide gas, which being likewise in a glowing con-
“dition decomposes the present hydrocarburetted and combines
“with it. This is not done by a mere mechanical gas mixture, but
“by the thus formed hydrogen, which dissolves and absorbs the
“great excess of coal that the hydrocarburetted substances lose
“at the time of decomposition, and this combination produces
“the above luminous gas.” The hydrogen substances are wood,
“pitch, resin (American), oil of resin, coal tar, brown coal tar,
“oil of pine, &c. The apparatus consists of a retort placed over
“a furnace, and having inserted three or more pipes or tubes
“having a U-shaped pipe or water closing attached near each
“of their upper ends, and having a funnel at the top of each.
“The funnels are for the purpose of receiving tar and water from
“a cistern above divided into partitions, and forwarding those
“liquids to the retort below which is filled with charcoal. The
“material being now red-hot, the liquids are allowed to fall over
“the top thereof. The gas now generating passes through a pipe
“in the end of the retort into the condenser and gasometer.”

[Printed, 10d. Drawing.]

A.D. 1861, June 4.—N^o 1411.

STANFORD, EDWARD CHARLES.—“Improvements in obtain-
“ing products from seaweeds.”

Instead of being burnt for the purpose of obtaining ashes there-
from, the seaweeds are exposed to a destructive distillation, “by
“which means not only are the ashes obtained in a more favour-
“able condition for separation of iodine and potash, but the
“vaporized products, which are lost by process of burning, are
“condensed and retained for use.” The retorts in which the dis-
tillation is conducted are furnished at the upper part with conduit
pipes, which carry the proceeds of distillation to an iron main, and
thence through a series of ordinary iron pipe condensers, from
which the gas evolved passes through a pair of scrubbers to a
gasometer. The charcoal is withdrawn from the retort in close
boxes run under the retort, and removed from the boxes when
cool; it is then lixiviated as ordinary kelp. “The charcoal con-

“tains the whole of the iodine and potash of the seaweeds
“employed, and it is comparatively free from sulphur compounds,
“and it quickly affords a colorless solution of the salts it contains. This solution is treated according to the well-known
“processes to separate the iodine and also the potash and soda
“salts.” The gas produced by distillation “possesses considerable illuminating powers, and may be used in lighting the
“factory, heating the stills for the purification of the oils, and, if
“desired, the retort also.”

[Printed, 4d. No Drawings.]

A.D. 1861, June 5.—N^o 1414.

SMITH, EDMUND.—(*Provisional protection only.*)—“Improvements in wet gas-meters.”

Upon the axis of the measuring drum is placed “the usual
“worm wheel to give motion to a toothed wheel, the axis of which
“communicates motion to registering apparatus. Upon this or
“other suitable axis is affixed an arm of form suitable, by acting
“upon another arm or part of a water scoop or elevator, to cause
“one end thereof to be raised and depressed to take up . . .
“fluid from a reservoir, . . . and allow such . . . fluid to fall
“into the measuring part . . . of the meter. There is also an
“overflow at the required height . . . into the reservoir. The
“gas entering the meter passes into a chamber, the lower end of
“which opens into the reservoir some distance below the ordinary
“water line thereof, and . . . contains a float, also below the
“water line, connected by a spindle with a valve in such manner
“that when there is a deficiency of . . . fluid in the reservoir,
“the float will fall and close the valve, and prevent the gas
“passing in; the cylinder and float being so deep under water
“prevents a very strong pressure from closing the valve. A pipe
“from this chamber below the valve therein dips down to near
“the bottom of the reservoir to allow the . . . fluid to escape
“therefrom when required, and also by an arm or passage therefrom serves to convey gas into the centre of the measuring
“wheel. . . . This meter is supplied with . . . fluid by a pipe
“with a screw cap, and the surplus is removed by an inverted
“syphon pipe from the reservoir. There is also another valve
“with float in the body of the meter adapted when there is

"a deficiency of . . . fluid in that part, or the meter is tilted forward to close the outlet valve."

[Printed, 4d. No Drawings.]

A.D. 1861, June 11.—N^o 1497.

CHALMERS, CHARLES.—(*Provisional protection only.*)—"Improvements in gas stoves."

The "Merchiston" gas stove is based to a certain extent upon No. 2588, A.D. 1859. Any suitable number of Bunsen burners are arranged on a base plate, each being connected by a separate pipe and stop-cock with the supply pipe, and surrounded by a small air chamber with a door to admit of lighting and regulating the burners. A three-inch air pipe leading from the exterior of the building opens into the air chamber, where the air mixes with the gas as it flows up the tube of the burner and adds to the heating power. The stove consists of a metal cylinder placed on a tripod. The top of the cylinder is dome-shaped, and the bottom conical. In the centre is a vertical tube extending from within a short distance of the top of the cylinder, and passing out at the bottom and into the air chamber, where it terminates just above the burners. The volume of heated air passes up the central tube and then into the stove, the surface of which radiates the heat into the apartments. The impurities of combustion are carried off to the exterior of the building by a pipe from near the bottom of the stove, the current of heated air as it ascends continuously occupying the place of the cooler portion of the air.

[Printed, 4d. No Drawings.]

A.D. 1861, June 14.—N^o 1528.

SUMMERSCALES, JOHN, and MASON, MARK.—"Improvements in gas singeing apparatus."

The singeing is performed by means of gas and atmospheric air united by passing the materials or fabrics in contact with a series of gas jets, the gas and air being forced through the burners by a fan, or drawn through by exhaustion. "In practice we find that the flame penetrates into the fabric or substance, and impoverishes it by burning the loose fibre out from betwixt the threads of the fabric as well as from the surface thereof, which is very objectionable, to remedy which we employ a bed or dead

" surface placed in contact with the fabrics on the opposite side to
" the gas jets, which prevents the flame penetrating into the sub-
" stance. . . . To maintain an equal heat of the bed we have
" it hollow, and supply it with water, which we keep at or near as
" may be an even or uniform temperature. The external sur-
" faces of this hollow bed or vessel are made smooth, and we first
" pass the fabric to be singed over or on the opposite side to the
" jets and then around a roller, returning it betwixt itself and
" the vessel, the two parts of the fabric being in contact and
" pressing upon the vessel; the rubbing together of the surfaces
" raises the pile or loose fibre, and thus dispenses with a brush,
" and the heat of the vessel prepares it for the singeing process."

[Printed, 10d. Drawing.]

A.D. 1861, June 19.—N^o 1581,

HARRIS, WILLIAM JAMES.—(*A communication from Joseph A. Sabbathon.*)—"Improvements in dry gas-meters."

1. To obviate the defects of ordinary gas-meters which, having a series of measuring chambers closed by flexible diaphragms combined with valves having flat surfaces, and either sliding or turning upon flat valve seats, which are fitted with ports that communicate with the variable chambers in which the gas is measured, the first part of the invention consists of a combination of the series of flexible diaphragms with a turning conical valve, constructed on the principle of Schiele's antifriction curve, and filled with an inlet passage at one of its heads, with an outlet passage at its opposite head, with two lateral ports communicating respectively with the inlet and outlet passages, and turning in a conical seat fitted with as many ports as there are variable measuring chambers. 2. The use of a stuffing box between the valve and the register is obviated by a combination of the valve and valve seat before mentioned, with an inclosed inlet passage that has no communication with the gallery by means of a supplementary port in the valve seat, and a supplementary passage in the head of valve. 3. To obviate the use of stuffing boxes upon the stems of the diaphragms which impart motion to the valves of the meter, the stems of the diaphragms are combined with conical stoppers fitted by grinding into conical seats, the stoppers and seats being also constructed upon the principle of Schiele's antifriction curve.

[Printed, 10d. Drawing.]

A.D. 1861, June 28.—N° 1650.

SWINNERTON, THOMAS.—“A new or improved manufacture of coal gas by the surplus or waste heat of the blast, vent, and puddling furnaces used in the manufacture of iron.”

This invention consists in a peculiar arrangement of gas retorts in the blast ovens used for heating the blast of air which is blown into iron smelting furnaces, and also in arranging the said retorts in puddling furnaces used in the same manufacture. “In carrying my invention into effect by means of blast ovens I proceed as follows:—I place the retorts, which are by preference of a cylindrical figure, in the said ovens, the said retorts lying longitudinally in the said ovens, *i.e.*, parallel with the fire-bars of the said ovens. The said retorts are supported upon supports at a height about 3 ft. above the fire-bars, and underneath the arch formed by the curved pipes, through which the blast to be heated passes. The heat of the blast oven, besides heating the blast pipes, heats the said retorts sufficiently for the purpose of manufacturing coal gas. The retorts are charged with coal, and the gas obtained is purified in the ordinary manner.”

[Printed, 8d. Drawing.]

A.D. 1861, June 29.—N° 1666.

CLARK, WILLIAM.—(*A communication from Etienne Charles Zacharie Bouchard.*)—“Improvements in the distillation of solid and liquid combustible matters.”

“This invention relates to a new mode of distilling combustible materials so as to obtain lighting or heating gas, or it may be charcoal. This new method consists in injecting in the middle of the combustible materials hot incombustible gases, so that the heating and destructive distillation may be, so to speak, interior and molecular, and have an active effect on the gaseous or liquid products which are evolved. I employ this method of distillation for all combustible materials, either solid or liquid, or a mixture of the two. Under the name of incombustible gas I employ azote, carbonic acid, hydrogen, and other gases employed either separately or together, and previously heated. I can employ especially the fumes resulting from complete carbonization. I apply, for example, this new method of distil-

lation to peat placed in furnaces similar to those used in the manufacture of gas. In order to obtain greater results and more perfect distillation, I reheat the volatile products generated in a new and special retort, in which all the carbonate of hydrogen liquids or tar are converted into gas." The invention consists also in producing double distillation in a central retort, and in manufacturing gas in a compressed state for portable and other purposes.

[Printed, *8d.* Drawing.]

A.D. 1861, June 29.—N^o 1669.

LIVESEY, WILLIAM.—"Improvements in wet gas-meters."

1. To connect the meter with the iron service pipes without the use of lead or other flexible pipes, the inlet and outlet tubes on the same are formed so as to be in a line with each other, both being situated at the back of the meter, and each tube is provided with a main cock opening horizontally, and to this the service pipes are directly connected. To regulate the inlet and outlet pipes simultaneously, these cocks are connected so as to be opened and closed by the same handle. The level of the water in the meter is ascertained by a tube of a peculiar construction. To prevent the water evaporating, and the oscillation of the lights from irregularity in the pressure, oil is placed on the top of the water. To prevent tampering with the meter, a float with vertical rods, which pass through an opening in the inlet chamber through which the gas enters the meter, is so arranged as to bring one of two valves into play, and thus shut off the ingress of gas into the meter or cut off the supply. The gas enters the measuring drum by a tube pending from the top of the meter at one side of the same to within a short distance of the water, the gas passing first into this tube through the space between the edge of the same and the level of the water, and then down another tube placed inside the first and descending below the water. This last tube passes along the bottom of the meter, rising up again in the centre of the same, and eventually passes into the measuring drum. To simplify the index a large dial is used, the hand of which registers 100,000 cubic feet, with two smaller dials inside the larger one to register respectively units and hundreds of cubic feet.

[Printed, *10d.* Drawing.]

A.D. 1861, July 6.—N° 1717.

SMITH, ROBERT ANGUS.—“Improvements in purifying gas.”

This invention is principally intended for the removal of bisulphide of carbon, and consists in so disposing a solution of a compound of lead or other metal in caustic alkali as to present to the gas a sufficiently large surface. The metallic sulphide formed is oxidized by exposure to the air, and so fitted for repeated use. The gas should be previously purified by “some ordinary means” from its sulphuretted hydrogen and carbonic acid. It is passed through sawdust or other absorbent moistened with a solution of oxide of lead (or litharge) in caustic soda, and arranged on thick layers. Instead of oxide of lead a saturated solution of sulphate of lead may be used.

[Printed, 4d. No Drawings.]

A.D. 1861, July 9.—N° 1739.

PARKINSON, WILLIAM COULSON.—“An improved friction-
“less bearing for gas-meters.”

Instead of having the crank, flag wire, and other movable parts “turned down at the end, so as to run in a socket or bearing, as in ordinary dry gas-meters, I point the shaft, and place
“a piece of glass or other material, as flint, pot china, stone, or
“earthenware, in place of the socket for the point of the shaft or
“spindle to work upon, and in that case it does away with all
“friction, and cannot get fouled as the ordinary spindles and
“centres generally do by the dirt that accumulates round them,
“as by my present invention the point of the shaft wears away
“the dirt as it accumulates. This invention can also be applied
“to wet gas-meters.”

[Printed, 6d. Drawing.]

A.D. 1861, July 9.—N° 1741.

COCHRANE, CHARLES.—“Improvements in treating gas in
“its passage from blast furnaces to the furnaces, stoves, boilers,
“or other heating apparatus where the gas is employed.”

It having been found that the gas passing off from a blast furnace is loaded with solid matter in a fine state of division, it is proposed by this invention to subject such gas before it arrives at the place of consumption to “exhausting or forcing machinery,
“together with a ‘scrubber’ or apparatus capable of dividing
“the gas after it comes from the head of the furnace into very

" minute streams or divisions, and capable also of subjecting the
 " gas, when so divided, to the action of water in such manner
 " as to remove all dust from the gas. . . . The ex-
 " hausting or forcing machinery which I prefer to employ
 " consists of pumps, such as are used for forcing air to blast
 " furnaces."

[Printed, 1s. 4d. Drawings.]

A.D. 1861, July 11.—N^o 1748.

KIDD, JOSHUA. — (*Provisional protection only.*)—" Improve-
 " ments in the manufacture, application, and combustion of gases,
 " and in apparatus connected therewith."

" From the centre of the interior of a gas holder, dipping into
 " a tank or well in the usual way, I suspend a piece of zinc, iron,
 " or other proper material. The tank is partially filled with acid
 " or other proper liquor. As the gas is generated by the action
 " of the acid or liquid on the suspended zinc, iron, or other mate-
 " rial, it rises through the acid or liquid, and forces the holder
 " upwards." If the generation of the gas is too rapid, the holder
 " rises and lifts the suspended metal out of the liquid. The
 " gas generated is carburetted, when required, by being brought
 " into contact near the point of combustion with the vapour of
 " naphtha or benzole. " I can also make the holder fixed, and then
 " the pressure of the gas forces the portion of the acid or liquid
 " which is inside the holder below the suspended zinc, iron, or
 " other material, thus stopping the generation of the gas till
 " sufficient has escaped to allow the acid or liquid to rise and
 " again come in contact with the suspended zinc, iron, or other
 " material." A novel-shaped burner, having a hollow chamber in
 " the centre of the top, "so that the point or points of the escape
 " of the gas is or are materially below the level of the top of the
 " burner. This burner has in its interior a fish-tail nib, but it
 " can also be used as a cap to fit on the usual fish-tail or bat's-
 " wing burner, and when so used it may or may not have such
 " internal nib."

[Printed, 4d. No Drawings.]

A.D. 1861, August 1.—N^o 1912.

SHAW, HENRY.—" Improvements in wet gas-meters."

An additional supply of water is afforded to the meter from a
 reservoir or tank by means of a valve or pipe opened as the water

in the meter is lowered, and shut when the required supply is admitted. Within the meter is placed a float with a valve seat "of any suitable material, metal, wood, or caoutchouc." As the water in the meter is raised to its proper level, "so will it float the valve seat to its shutting off any further supply than what may be necessary."

[Printed, 6d. Drawing.]

A.D. 1861, August 19.—N° 2057.

CATHELS, EDMUND SMALL.—"Improvements in compensating gas-meters."

To the ordinary float which works the inlet valve is attached a water valve placed at or near the bottom of a reservoir, formed by partitioning off the upper part of front chamber of the meter. When the water level in the meter is lowered by evaporation, or otherwise, the water valve is opened, and water from the reservoir, formed as above described, descends into the meter until the float is again raised and the valve closed. The valve rod may pass through the water to the float beneath, or through a water-tight tube; in the first case the gas is conducted by a tube to the waste water tube, thence to the syphon pipe; in the second case the gas passes down the water-tight tube through the reservoir.

[Printed, 4d. No Drawings.]

A.D. 1861, August 20.—N° 2071.

SOMERVILLE, JOHN.—"Improvements in apparatus for drilling and tapping gas and water mains and pipes, and in preventing leakage therefrom."

The apparatus employed for this purpose consists of a bow or bridge-piece or bracket secured to the main or pipe to be drilled by clips or straps, and having fitted to it a set screw for the purpose of applying pressure to a combined drill and tap of a peculiar construction, which is actuated by an ordinary ratchet brace or other suitable contrivance. Immediately above, and forming part of the drill, is a cylindrical piece of metal of the same diameter as the hole made by the drill, which keeps the drill steady, and prevents the escape of the gas or water. The tap is made on the upper part of the stem of the drill, immediately above the cylindrical part, and has two or more annular grooves round the at intervals, into each of which is fitted a circular washer of india-

rubber, leather, &c. The diameter of the washers is slightly larger than the hole to be tapped, so as when the tap penetrates the main to effectually plug the hole, and prevent any escape of gas through the longitudinal grooves or slots made in the tap. "When the screw thread is sufficiently cut the tap is removed, and the service pipe is inserted in the usual manner."

[Printed, 8d. Drawing.]

A.D. 1861, August 20.—No 2075.

GYE, FREDERICK.—"Improvements in constructing gasometers and gasometer tanks."

The patent gasometer tank is so constructed "as to render available much of the central space of land now covered or occupied by the tank of a gasometer." It is made double at the outer circumference to receive the water or fluid employed, the interior space being left free for use when roofed or closed in air and gas tight. "I prefer to use the compartment in the centre of a tank to act as a second or interior tank to receive another but a smaller gasometer, though such space may otherwise be advantageously employed. . . . When thus employing the enclosed and roofed space interior of the tank of a gasometer to receive a smaller or other gasometer, the space between the roof of the enclosed compartment is in communication with the open atmosphere by suitable pipes or passages, so that the space may be at all times occupied by air; or such space may be so arranged as to receive gas when the inner gasometer is discharging its contents, and the gas received into the central compartment may be discharged into the mains when the inner gasometer is being charged with gas."

[Printed, 6d. Drawing.]

A.D. 1861, August 31.—No 2176.

HUGHES, EDWARD JOSEPH.—(*A communication from Emil Langen.*)—(*Provisional protection only.*)—"An improved apparatus for collecting the gases which escape from furnaces."

Upon the plate of the furnace, and surrounding its opening, is a conical cast-iron ring, fitted round the chimney, and provided with a suitable number of openings to feed the furnace. At the upper part of the furnace is placed a helmet-shaped pipe for receiving and delivering the gases as collected. Around the bottom

end of the receiving pipe is rivetted an angular iron hoop, serving as a base for another conical ring which surrounds the gas pipe, which ring, by means of vertical bars and screws, can be brought into a horizontal position. The apparatus has a cover which can be raised by balance levers to admit of the materials to be melted. A hemispherical valve is provided, which closes by its own weight, and opens if the gases flow freely, thus serving as a safety valve. To prevent the bursting of the cover and the conical rings, a narrow piece of sheet metal is rivetted on them.

[Printed, 4d. No Drawings.]

A.D. 1861, September 5.—N° 2221.

REID, JOHN.—(*Provisional protection only.*)—"Improvements
" in the treatment of gas and the apparatus employed therein,
" with a view to its more accurate measurement in wet gas-
" meters."

The object of this invention is to prevent the gas absorbing moisture in passing through wet gas-meters, by causing it to pass through a vessel divided by partitions, and thus take a circuitous route to the meter. If the saturating chamber is rectangular, the partitions are arranged longitudinally, so that the gas passes along one channel and around the partition into the contiguous channel, and so on throughout the series. The lower part of the chamber is filled with water. The gas absorbs moisture as it passes over the water, the operation being facilitated by hanging fabrics over the partitions, and thus raising the fluid by capillary attraction; thus the gas is saturated with moisture before entering the meter, and thereby prevented from affecting the water level.

[Printed, 4d. No Drawings.]

A.D. 1861, September 18.—N° 2326.

COWPER, EDWARD ALFRED.—(*Provisional protection only.*)—"Improvements in apparatus for freeing gases from dust and
" other particles of matter floating therein, and for causing
" vapours or gases to be absorbed by liquids."

The impurities are removed from gas by causing a large extent of surface wetted with a liquid to be exposed to the gas in a finely divided state, in such a manner that every minute portion of gas shall be brought into contact with such wetted surface, *while any gas* capable of being absorbed by the liquid shall be

largely absorbed thereby. One of several means described consists of a cylinder of fine wire gauze, with several similar concentric cylinders within it, all closed at the ends, and caused to revolve in the liquids so as to become wetted with it, after which the gas which it is desired to cleanse or condense is passed into the inner cylinder, and allowed to find its way through the others, and escape on the outside into a box or case. The passage of the gas may be aided by a steam jet or blast. The same apparatus may be applied for causing liquids to be impregnated with certain gases. If it is wished to cleanse the gases given off from the top of a blast furnace, then water is to be used. The gas so cleansed is well adapted for burning under boilers or hot-blast stoves, according to No. 1404, A.D. 1857.

[Printed, 4d. No Drawings.]

A.D. 1861, September 21.—N° 2363.

COCKEY, HENRY, and COCKEY, FRANCIS CHRISTOPHER.—
“Improvements in apparatus employed in the manufacture of
“gas.”

This invention relates to a peculiar arrangement connected with those parts of the apparatus employed in the manufacture of gas for lighting and other purposes known as the “dip pipe” and “hydraulic main,” and its object is to allow for the contraction and expansion, or rise and fall of the ascension pipe, and thereby prevent the strain upon the joints of those pipes and upon the mouth pieces of the retorts. “According to this invention it is
“proposed to fix in the hydraulic main a short flanch pipe, sufficiently long to give the necessary seal for the dip pipe, and this
“pipe is to be bored out so as to allow the dip pipe to pass through it. The outside of the dip pipe is to be turned to fit the short
“pipe truly, but allowing it space to shift easily through it as the
“ascension pipe expands or contracts. In fixing the pipes the
“lower edge of the dip pipe should extend about a quarter of
“an inch below the outer pipe.”

[Printed, 6d. Drawing.]

A.D. 1861, September 23.—N° 2377.

JACOB, JOSEPH.—(*A communication from Carl Preisenhammer and Carl Weniger.*)—“Improvements in the mode of, and apparatus for, obtaining and treating hydrogen gas, and the
“application thereof to various purposes, parts of which im-

"provements are applicable to the manufacture of iron and steel."

This invention is an improvement on No. 593, A.D. 1861. It having been found that during the process there described the iron gradually absorbs the oxygen until it is by degrees transformed into oxide of iron. The pure oxide of iron thus formed may, it is found, be advantageously used for the production of cast iron, malleable iron, or wrought iron, and steel, it depending on the quantity of reducing or carbonizing matter employed whether one or other of those products are obtained. For the production of cast iron from the oxide the blast furnace or the cupola may also be employed. When the hydrogen gas and air flame are employed the process of puddling may be dispensed with, the heat being sufficiently intense to keep even the decarbonized iron in a molten state. In blast furnaces and in cupolas the gas and air are injected into the furnaces through the tuyeres, instead of air. Instead of a gasometer of ordinary construction for the hydrogen, a closed vessel or cylinder filled with water is used, the water being displaced and flowing into a receiver as the gas is generated. The burners used consist of two pipes, one within the other, the outer one being the gas pipe, the inner the air pipe. The external end of the air pipe is made in the form of a cone, and fits into an internal cone at the end of the gas pipe. By withdrawing the air pipe from the gas pipe the escape of the gas can be regulated at pleasure.

This invention relates also to the use of certain combinations of hydrogen gas, produced as described, and coal gas. The hydrogen gas is forced either direct from the generator by means of an exhauster, or from the gasometer into the retort in which coal gas is being generated; "this will have the effect of increasing the yield of gas from a certain quantity of coal by dissolving and combining with certain products of the coal, which in the ordinary process form into tar and solid parts. By this process the illuminating power as well as the heating power, when used in combination with air, can be considerably increased."

[Printed, *ed.* No Drawings.]

A.D. 1861, September 25.—N^o 2396.

RICHARDSON, THOMAS.—(*Provisional protection only.*)—"Improvements in the manufacture of muriate of iron for the purification of coal gas."

This invention consists in "dissolving the burnt sulphur ore left as a waste product in the manufacture of sulphuric acid in muriatic acid, and evaporating the solution to dryness, or in drying up the solution with sawdust, charcoal, small coke, gypsum, the waste burnt sulphur ore ground to powder, or any natural oxide of iron in powder, and in employing any of these mixtures with lime or magnesia in the usual way in the purification of gas."

[Printed, 4d. No Drawings.]

A.D. 1861, September 25.—N° 2397.

VAUGHAN, JOHN.—(*Provisional protection only*).—"Improvements in treating gas produced by blast furnaces in its passage from the blast furnaces to other furnaces, stoves, boilers, or other heating apparatus where gas may be employed."

"I propose that jets of steam shall be so situated as to increase the draught and accelerate the passage of the gas through tubes conveying it, thereby relieving the furnace to a considerable extent from forcing the gas into the purifier. When the gas comes under the action of the jets of steam, the coarser particles of the dust and other matter with which the gas is mechanically mixed are propelled under water; the gas also is forced under water partly, but immediately rises and leaves all impurities behind." The water is constantly replaced by circulation so as to carry off the impurities; it also condenses the steam from the jets, and prevents it from rising with the purified gas. To cause this condensation before the gas reaches its destination, the gas is caused to pass through a stratum of coke, open brickwork, or other material, through which a stream of cold water is always kept running.

[Printed, 4d. No Drawings.]

A.D. 1861, September 27.—N° 2415.

SMITH, GEORGE.—"Improvements applicable to gas-meters."

The object of this invention is to obviate the defect in gas meters caused by the soldering up of the external case, and to dispense with the water-regulating screwed plug on the side of the charging plug chamber. "A small horizontal branch pipe is connected to the present fixed vertical syphon or overflow pipe at a position either above or below the connecting branch pipe

" which communicates with the drum chamber of the meter.
" From the horizontal branch pipe springs a vertical pipe, which
" runs parallel to, and a little distance from, the ordinary fixed
" syphon or overflow pipe. This supplemental vertical pipe is
" constructed lower, or, at all events, not higher than the
" minimum height of the water required to be in the meter. On
" this fixed vertical supplemental pipe is fitted an external pipe,
" which is capable of being slid up and down thereon within
" a given range, like the slide of a telescope. This sliding tube
" is actuated by a rack and pinion, or bands working round or
" over a small pulley on a horizontal spindle, or by a lever
" motion, or their mechanical equivalent, all of which are to be
" worked by a key from the side, bottom, top, or back of the
" external casing of the meter." The vertical sliding tube is
fitted on to the vertical supplemental pipe on which it slides,
either so as to be water-tight, or with annular grooves to hold
packing.

[Printed, *sd.* Drawing.]

A.D. 1861, September 28.—N^o 2426.

LANE, DENNY.—"Improvements in apparatus whereby to
" regulate the pressure or flow of gas, water, and other fluids."

This invention consists, so far as the present series is concerned,
1, in apparatus termed "brake and tapped motion" applied to pur-
poses such as pumping gas, during its manufacture, from the retort
to the gas holder. When used with the gas exhauster, in order to
vary the velocity of the exhauster in the same rates with that of the
engine, a beam from which pallets are suspended is so connected
with a small gas holder as to be horizontal when the exhauster is
proceeding at its proper rate, but to be depressed at one end when
the exhaustion is too rapid, by the small gas holder being drawn
down, and thereby bringing the tappet into action and cutting
off the supply of steam. On the other hand, if the supply is not
sufficient, the gas holder is raised, the other end of the beam is
depressed, and the supply of steam increased. 2. In automatic
apparatus for varying the initial pressure with which gas is
delivered from the works at different hours. Two forms of this
are shown, one, in which a strip of pasteboard divided so as to
form a scale is moved by clockwork, and attached to a gas holder
surmounted by a rod. One edge of the strip is straight, the

other curved. The rod carries at its end a beam, which is horizontal if the actual pressure of the gas is equal to that indicated by the curve as being required for the particular curve; if it be greater or less, the beam is deflected in one or the other direction, so as to make it coincide with that indicated by the curve. The deflection of the beam may be made to work two electro-magnets, one of which opens a cock which allows water to flow into a vessel in the top of the gas holder of the ordinary governor, and the other opens a cock allowing water to escape from the same, and thus increasing or diminishing the pressure of the governor.

[Printed, 1s. 8d. Drawings.]

A.D. 1861, October 3.—N° 2473.

MALAM, WILLIAM. — "Improvements in apparatus for the manufacture of gas."

Self-acting retort feeder.—The hopper or charging box is placed so as to have its discharge end within the retort. Within the retort is also a travelling scoop, shovel, or box, the top of which is partly open and partly closed, which takes the coals from the hopper mouth by means of the scoop, and carries them to the other end of the retort, where it discharges them.

In another arrangement the hopper has at bottom a valve door or movable end, which is opened and closed by mechanical means or by hand, a shank passing out of the retort. "When I place or arrange retorts in casings of fire-clay, or such like refractory material, then, instead of constructing this casing in one piece, I form it of a number or series of pieces, so that any one of them may be repaired or replaced without having to repair or replace the whole casing, and I prefer to form the casing of a series of arches, each arch consisting of detachable segments, the segments and the arches fitting together by lapping step-joint bevilling, chamfering, or the like. The bed may also be formed in pieces. The composition I prefer is a mixture of two-thirds Stourbridge clay and one-third ground stuff."

[Printed, 10d. Drawing.]

A.D. 1861, October 5.—N° 2491.

O'CONNOR, PATRICK.—(*Provisional protection only.*)—"Improvements in the construction of gas stoves for heating and warming."

Instead of applying the gas to the vessel containing the water, or a supplementary vessel, the stove or apparatus is immersed in the water, and removed when the desired temperature has been obtained. The principal part consists of a serpentine metallic casing exposing a large surface of water to the heat. Gas is conveyed by a flexible tube, is burned at jets under a part of the apparatus formed into an arch, and "combustion is maintained " by supply of air received at one end of the apparatus, the pro-
 " ducts being carried through the apparatus to the other end,
 " where, by a small intercepting inverted cup situate just over
 " the surface, they are thrown on to and absorbed by the water
 " being heated, thus preventing the escape of the noxious effluvia
 " into the atmosphere." To secure a large superficial metallic area for the radiation of heat in stoves, water is made to circulate within the casing. The bottom framing supports and communicates with a saddle boiler, from both ends of which are water spaces carried vertically, resembling with the semicircular or arched communication on the top an inverted U. On the top of this arch is a water-supply cistern or expansion head, from which a pipe is carried down through one of the legs near to the bottom. The gas jets are applied under the saddle boiler, and as the bracket conveying the gas is jointed, the lights may be used for illumination. The products of combustion are got rid of in a similar manner to that above mentioned.

[Printed, 4d. No Drawings.]

A.D. 1861, October 5.—N° 2495.

CLARK, WILLIAM.—(*A communication from Jean Baptiste François Maliquet Allegret and Lucien Victor Teste.*)—(*Provisional protection only.*)—"An improved gas regulator and purifier."

The object of this invention is to filter the gas before it is consumed in the burner. "For this purpose a plug or mass of felt, " wadding, or flock is placed in an enlargement or chamber
 " made in the base of the burner through which the gas passes
 " and is thereby purified, and burns under a steady and constant pressure. It also produces a saving in the consumption
 " of gas."

[Printed, 4d. No Drawings.]

A.D. 1861, October 7.—N° 2504.

EVANS, FREDERICK JOHN.—"Improved apparatus for generating gas."

Instead of a series of horizontal retorts side by side in a furnace, a vertical retort of large capacity is enclosed in a furnace, the fire-place of which is placed near the bottom of the retort. The flue leading from the fire-place rises spirally round the retort, and has an exit to the chimney near the top of the retort. The retort is made of fire-clay, of an oval form in cross section, and tapering off slightly towards the top. Coal is discharged from waggons run on a level with the top of the furnace into the retort (which has an opening at the top closed by a drop-valve or plug). The lower end of the retort is bent out of line to bring its extremity to the outside of the furnace, where it is fitted like ordinary retorts with a door to make it air-tight and admit of removing the coke. A pipe leading off from the upper part of the retort above the furnace conducts the gas generated to the ordinary condenser. This arrangement admits of charging and discharging retorts simply by the action of gravitation.

[Printed, 10d. Drawing.]

A.D. 1861, October 9.—N^o 2516.

SMITH, WILLIAM.—“Improvements in apparatus for measuring “and regulating the pressure of gas.”

1. Mode of constructing the level pipe in the “consumer’s “compensating gas-meter,” so that it can be adjusted by means of a stud or button at the exterior of the meter, the pipe being of some flexible material. At the outlet of the meter is a float in water, on which the outlet pressure acts, and to the float is connected a cone working in a valve for the purpose of regulating the pressure of the outlet gas. 2. To prevent fraud by tilting of the meter, a rod swinging on a pivot is hung to the back plate of the meter, which, when the meter is tilted, swings forward and comes in contact with a projection on the measuring wheel; as its rotation is thus arrested, the supply of gas is stopped. 3. To regulate the diaphragm in dry gas-meters a crank is placed on the valve shaft, and a small lever inserted in a socket made in the extremity of the crank to which the connecting rods of the diaphragm are attached. The small lever is fixed by means of a set screw, therefore when it is required to change the throw of the diaphragm it is only necessary to loosen the set screw and adjust the small lever. 4. To the metal plates used on the diaphragms of dry gas-meters, instead of covering the edges and

face of the same with leather, a smooth edge is made by a piece of metal turned over the edges; also in dry meters the inlet and outlet pipes are arranged within the outer casing for convenience of packing. 5. In single-light governors a cone, which can be adjusted by a screw cut on the stem of the same, is fastened in the outlet pipe of the regulator, and beneath it is a flexible diaphragm with a hole pierced in the centre serving for a valve. Any variation of the pressure of the gas raises or lowers the flexible diaphragm, and enlarges or lessens the aperture in the diaphragm through which the gas passes. 6. To indexes of all kinds of meters to make all the hands on the dials turn in the same direction, an intermediate pinion is used between the usual wheels and pinions.

[Printed, 10*d*. Drawing.]

A.D. 1861, October 10.—N° 2527.

WILLIAMS, WILLIAM JAMES.—(*Provisional protection only.*
—“An improved process of charging illuminating gas with the
“vapour of the hydruret of carbon for the purpose of increasing
“its illuminating properties.”

This invention consists in causing the gas in its passage from the meter to the burners to pass through “a series of rows of
“perpendicular cords or threads, or their equivalents, saturated
“with hydrocarbon liquid, by which it becomes charged with
“hydrocarbon vapour, and as the gas is liable to become over-
“charged with the vapour and cause a waste of the hydruret of
“carbon, often becoming very troublesome by condensing and
“filling up the pipes, obstructing the flow of the gas, and flowing
“out at the burners when opened, I cause the gas to pass through
“a condenser, where the excess of hydrocarbon vapour and the
“liquid resulting from the condensation flows back to the
“evaporating chamber, or some other receptacle, from which it
“can be returned to the evaporator, while the gas in a properly
“charged state passes on to the burners.”

[Printed, 4*d*. No Drawings.]

A.D. 1861, October 17.—N° 2580.

SMITH, WILLIAM.—(*A communication from Hugo Carstanjen.*)—
“Improvements in the apparatus for, and method of, increasing
“the illuminating power of gas.”

This invention consists in the use of benzoine as an agent for increasing the illuminating power of gas to any required degree. The chamber through which the gas is made to pass is divided by means of a horizontal diaphragm in the lower part of it, the upper and lower portions being connected by a series of tubes or sheet spaces. Through these tubes or sheet spaces cotton wicks or other plaited material pass into the lower chamber, and bring up the liquid benzoine in it by capillary attraction. The benzoine is supplied to the lower chamber from a vessel or reservoir attached to it. "At one end or side of the vessel, and communicating with the upper portion thereof, a tube or main pipe is connected by which the gas to be charged is admitted, and which, after passing through the apparatus, may be discharged from the opposite end or side thereof under regulation. By making a junction piece or circuit pipe between the inlet and outlet pipes, and inserting cocks or taps in such position as the gas may be shut off from the apparatus, and be caused to pass direct to the delivery side, instead of through the apparatus, the gas may be consumed without being impregnated or charged with the benzoine, or, subject to regulation, it may be passed in part only through the apparatus, . . . and any lesser degree of illuminating power than that which the apparatus is capable of effecting may be imparted to the gas on its way to the burners."

[Printed, 6d. Drawing.]

A.D. 1861, October 19.—No 2607.

WEBSTER, JAMES.—"Improvements in manufacturing oxygen gas and obtaining certain other products."

This invention consists in a mode of treating a mixture of nitrate of soda or other nitrate with an oxide of iron for the purpose of obtaining oxygen gas, nitrogenous compounds, and the base of the salt employed. For this purpose the mixture is submitted to distillation in a retort. The nitrogenous compounds contained in the gaseous products of the distillation are condensed, and thus those compounds are separated from the residue of the gaseous products, consisting chiefly of oxygen gas, which is collected in a receiver. The residuum in the retort at the end of the process contains the base of the salt employed, which, if it be an alkali or alkaline earth, is in a caustic state.

[Printed, 4d. No Drawings.]

A.D. 1861, October 19.—N° 2618.

EVANS, FREDERICK JOHN.—“An improved mode of, and apparatus for, carburetting gases for the purpose of illumination.”

The temperature of the gas is raised by passing it through a heating apparatus after it is led off in its heated state to a vessel containing hydrocarbon. The heated gas mingles with the vapour of the hydrocarbon, and thus becomes of increased illuminating power. The heating apparatus consists of a closed annular chamber formed by two inverted cylinders of different diameters, arranged concentrically and closed at top. The inner cylinder is open at bottom to form a combustion chamber, into which projects a gas-burner for imparting the requisite heat to the apparatus. The two cylinders are connected at their edges so as to form the bottom of the annular chamber. Near the bottom of this chamber is a union joint for admitting gas, and at the top of the chamber a second union joint to admit of its escape. The annular chamber is packed with iron borings or other good heat absorber, and the gaseous body intended to be carburetted is caused to percolate through the heat-absorbing medium.

[Printed, 6d. Drawing.]

A.D. 1861, October 21.—N° 2623.

SMITH, JOSIAH TIMMIS.—“An improvement or improvements in collecting the inflammable gases evolved from blast furnaces.”

This invention consists in constructing an arched cover or dome over that part of the furnace in which the mixture of materials charged into the furnace accumulates. In the centre of the dome is an opening into which a pipe is fitted. The pipe rises vertically for a short distance, then proceeds horizontally, and finally in the direction in which it is required to conduct the gas. Surrounding the central pipe is a large hollow brickwork cylinder, which protects the central pipe from the action of the heat produced by the combustion of that portion of the gas which escapes from the top of the furnace at or near the lower edge of the dome or cover; a series of semi-circular openings are made at the equidistant points, the said openings being for the passage of the materials charged into the furnace. The materials are charged upon the top of the dome or cover, or into hoppers situate above the holes, and as the materials in the interior of the furnace sink

down, the materials on the top of the dome or in the hoppers pass into the interior of the furnace, there always being left a clear space underneath the dome unoccupied by the said materials.

[Printed, 8d. Drawing.]

A.D. 1861, October 23.—N° 2646.

BRISON, CLAUDE, and CHAVANNE, ANTOINE.—“Improvements in ovens, kilns, or furnaces for manufacturing or other purposes.”

This invention relates to ovens, &c. in which retorts are used to effect a suitable rise in the temperature, and consists in providing the ovens, &c., either conjointly or not, with the ordinary horizontal retorts as used in the manufacture of illuminating gas, with one or more vertical retorts open at top and bottom, “the said openings to be closed at pleasure and as hermetically as required, the top one by a corresponding lid and the bottom one by a corresponding obturator or movable bottom jointed to one end of a counterpoise lever turning in suitable brackets, so as either to allow of applying this obturator against the lower opening of the retort, when this latter is filled with the materials to be treated therein, or by withdrawing the obturator cause the materials to fall out of the retort. At each operation the lid and the obturator may be luted against their respective openings of the retort, and if materials are to be acted upon in this latter evolving greatly gaseous matters, the lid or the retort itself may be provided with an abduction pipe or pipes for carrying the said gaseous matters into suitable purifiers, gasometers, collectors, or other apparatus, or even under or into the fire of the fireplace, or these gases may be allowed to escape at the side of the obturator in order to be burnt or decomposed by the heat of the fire.”

[Printed, 8d. Drawing.]

A.D. 1861, October 26.—N° 2692.

STEVENS, CHARLES.—(*A communication from Charles Antoine Fournier.*)—“Improved apparatuses for indicating escapes of lighting gas from the conveying pipes, and determining the precise leaking places of the said pipes.”

This invention is an improvement on No. 2717, A.D. 1859. As before, it consists of two operations, by one of which the escape

is indicated by the "revealer," and by the other the precise point of leakage determined. The "revealer," which is in connection with the gasometer on one side and the delivery pipe on the other, consists of two straight glass tubes, communicating by one of bent brass. In these tubes a coloured liquid is contained the rise and fall of which, occasioned by the pressure of the gas, and the time taken by the liquid to rise, is easily noticeable by means of a marker between the tubes furnished on each side with two small pointers. To give an alarm at night the positive and negative wires of a battery are immersed in one of the tubes of the revealer. The wires have platinum ends slightly bent towards each other, but do not touch. A float having a metallic bottom follows the movements of the liquid in the tube, and when it has sunk sufficiently forms the connection between the two wires, and so puts the alarm in motion. The apparatus for determining the leaking places consists of a glass vase, similar in shape to the test glass used for drying gases. It is made smaller near the bottom, and so forms two chambers, separated from each other by a perforated bottom of china, which allows the gas to pass, but prevents the pumice stone, with which the upper chamber is partly filled, from descending. The upper chamber has a close fitting cover with two openings, by one of which the volatile alkali is introduced; through the other the gas, which on an escape being detected, is prevented by the stop-cock from passing along the delivery pipe till it has passed first into the bottom chamber, then into the upper chamber containing the pumice stone which has been previously saturated with volatile alkali. The gas, as it passes through the pumice stone, aids the evaporation of the ammonia, which escapes with it by the second opening in the cover, to which opening a tube is adapted for conveying the gas back to the delivery pipe on the other side of the stop-cock. The escape is discovered by carrying along near the conveying pipes any suitable re-agent which the ammonia would act on, such as a glass rod wetted with muriatic acid.

[Printed, 8d. Drawing.]

A.D. 1861, October 29.—N^o 2711.

EAGLESFIELD, JOHN.—"Improvements in gas-burners."

This invention consists "in placing a triangular or other shaped piece of iron or other material immediately above the apertures of an ordinary fish-tail burner, so that the flame of gas

“ as it rises is split in two parts, and passes up on each side of
 “ the bar of metal. The flame, however, unites again some little
 “ distance above the splitting bar. The effect of thus splitting
 “ the flame causes it to burn with little or no blue, and therefore
 “ produces better combustion, and giving a much greater light
 “ for the quantity of gas consumed than would otherwise be the
 “ case. I raise one or two little brackets from the burner, on
 “ which I fix the triangular bar in a horizontal position with an
 “ apex or angle downwards, so as to present a cutting or splitting
 “ edge to the issue of the gas, the cutting edge being disposed
 “ some little distance above the hole or holes of the burner, so
 “ that the jet or jets of gas impinge fairly against the cutting
 “ edge.”

[Printed, &c. Drawing.]

A.D. 1861, November 2.—N^o 2761.

EVANS, GEORGE.—“ Improvements in treating peat to render
 “ it useful as fuel, and for illuminating and metallurgical pur-
 “ poses.”

A quantity of fresh cut peat is incorporated with about 25 per cent. of vegetable or mineral carbon dust, and, where fluxes are to be introduced, varied proportions of the mineral earths commonly used as fluxing agents, thus enabling the smelter to apply at one and the same time a fuel and a flux to the furnace. Dressed metallic ores may also be added to the composition. “ For the
 “ production of illuminating gas, I take the crude oil obtained
 “ from coal, coal tar, the oil extracted from bituminous shale,
 “ petroleum oils, or any one or more of the cheaper hydro-
 “ carbonaceous materials of commerce, and incorporate them
 “ singly or combinedly with peat, adding, if necessary, a small
 “ quantity of caustic lime to facilitate the extraction of the water
 “ and render more perfect the amalgamation of the peat with
 “ the oils, and in this manner I produce a substance from which
 “ gas for illuminating purposes can be obtained in great abundance, and which compound may be substituted for coal in the
 “ manufacture of lighting gas.”

[Printed, &c. No Drawings.]

A.D. 1861, November 2.—N^o 2763.

SPENCER, THOMAS, and ROBINSON, THOMAS.—(*Partly a communication from Alfred Delafol.*)—“ Improvements in ma-

"chinery or apparatus for making pipes and other articles of earthenware, and in the form of pipes for gas, sewage, and other purposes."

1. Use, in machines in which the direct action of steam or other fluid is employed for forcing the plastic material through or into dies, of an additional power in order to maintain the pressure after the moulding has been effected, and to work with less pressure. To this end the ram or piston is weighted, directly or by racks or pinions, and the weighting is effected by using a cistern, which may be charged with water or other heavy matter so that a portion can be drawn off as required. 2. Covering the plunger with cloth, leather, &c., which may be peeled off, and giving the plunger a roughened surface. 3. Making pipes or other articles with a "socket or other design at each end, by forcing the plastic material into a mould for forming one end, which mould is then removed so as to allow the pressure to force forward the material for the barrel, the second socket or end being formed in an upper mould. 4. Pipe for gas, sewage, &c. formed at one end with an enlarged part, within which is a recess, the other end having a part capable of fitting into a similar recess upon another pipe, the ends being so formed that the interior diameter is not interrupted with projections."

[Printed, 1s. Drawings.]

A.D. 1861, November 7.—N° 2795.

WIGHAM, JOHN RICHARDSON.—"Improvements in apparatus for the manufacture of gas, parts of which are also applicable for cooking purposes."

Arrangement of a vertical retort in which the surplus heat is made available for domestic purposes. The retort consists of a metal cylinder which passes through and is surrounded by a furnace enclosed around its sides with fire-brick and suitably mounted, the top part of the furnace being covered in by a metal plate upon which the utensils used in cooking are placed. The cylinder is supported vertically by means of a hollow ring or collar cast upon or around the top part of the same, the under side of the ring resting upon the metal plate or top part of the furnace. The hollow part of the ring or collar is filled with a metallic solution into which a lid or cover is inserted, serving to close the upper mouth of the cylinder hermetically. The lower *mouth* of the cylinder, through which the charge is drawn, is

hermetically sealed by dipping it a sufficient depth into a receptacle containing a liquid "lute," such receptacle being held or supported in the ash-pit beneath. "The retort is connected with the ordinary condensing and purifying apparatus, arranged in a compact manner, and connected by a system of water 'lutes,' hydraulic or other joints."

[Printed, 10*d*. Drawing.]

A.D. 1861, November 9.—N^o 2815.

DE LACOMBE, FRANÇOIS HENRY MARIE CÔME DAMIENS CHEVALIER FENIS.—(*Provisional protection only.*)—"Improvements in generating hydrogen gas for illuminating or other purposes, and in apparatus used therein."

This invention consists in projecting water in one or more small jets into an iron or other suitable vessel kept at a suitable degree of heat by means of a bath of molten lead or other metal, and further superheating the said steam thus produced by causing the same to come in contact with highly heated metallic parts, and finally introducing this superheated steam, with or without the addition of atmospheric air, into a highly heated retort partly filled with carbonaceous or other matters suitable for causing the decomposition of the steam, or, if air be mixed therewith, of the steam and air. Part of the superheated steam, in conjunction with a draught of air, is projected on the fuel in the fireplaces of the retorts and of the steam-generating and superheating vessels.

[Printed, 4*d*. No Drawings.]

A.D. 1861, November 11.—N^o 2829.

CLARK, WILLIAM.—(*A communication from Pierre Dernoncourt.*)—(*Provisional protection only.*)—"Improvements in safety lamps."

The following are some of the advantages of this invention :—
1. When once lighted and closed it cannot be opened without completely extinguishing the light. 2. The metal gauze is screwed to the lamp, so that if the suspending part is detached from any cause the gauze remains screwed to the lamp and preserves it entire. 3. The exterior and bottom of the lamp is free from anything that may be injured by blows, the mechanism

being all enclosed. The lamp is formed of a lower circular chamber on which is screwed the wire gauze; in the centre of said chamber is placed the wick holder and the wick, which rises and descends therein by means of a pinion on a rod, to which is attached a small ratchet, which only allows the pinion to rotate in one direction. "Supposing a wick of about $1\frac{3}{4}$ in. in length "to be lighted, the metal gauze is screwed on and a plate is then "fixed to the lamp by means of three notches and hooks, when "by slightly turning said plate the lamp will become closed. "This plate carries a toothed segment gearing with the pinion "regulating the supply of the wick, hence, when the lamp is "opened by turning said plate, the segment will turn the regulating pinion and cause the wick to return into the wick holder, "and thereby completely extinguish the light."

[Printed, 4d. No Drawings.]

A.D. 1861, November 11.—N^o 2830.

SHEDLOCK, JAMES JOHN.—"Improvements in gas-meters."

This invention renders a meter capable of delivering, as near as may be, the quantity of gas required within the hour, and of measuring the quantity passed through it, although a less number of lights have been burning than the meter is arranged to supply. The apparatus, which ensures the meter working at a pressure not exceeding a certain maximum, is "composed of a bent tube "in which is placed any suitable fluid. One end of this tube is "connected with the valve box into which the supply of gas first "enters, consequently the fluid in the bent tube will be subjected to the pressure of the incoming gas. The other end of "the bent tube has a float connected with a lever, so arranged as "to tend to close the inlet valve when the pressure of the gas "depresses the fluid in the leg of the bent tube which is connected with the valve box, and so raises the fluid and the float "in the other leg of the bent tube. The gas after passing the "inlet valve flows to a second valve chamber, where, in the "case of wet gas-meters, there is a second valve acted on by "the ordinary float of the meter. By these means the maximum "pressure at which the gas shall pass into a meter may be readily "regulated. The above-described apparatus may also be applied "to a dry meter."

[Printed, 10d. Drawing.]

A.D. 1861, November 13.—N° 2864.

LESLIE, JOHN.—(*Provisional protection only.*)—"Improvements in the manufacture of gas."

To manufacture gas from "hydrogen fluid" "the fluid is caused to flow or drop down a tube or series of tubes within a retort heated externally. At the lower end of the retort is a smaller chamber or retort, and from the upper part of this smaller retort rises an outlet pipe through the first-mentioned retort, up which the gas passes from the smaller retort for use. The hydrocarbons descend by the tubes nearly to the outer surface of the smaller retort, and the products thus caused to be evolved from these fluids will ascend to the other end of the first-mentioned retort, whence the products descend through another tube or series of tubes, which at their lower ends are connected to the smaller vessel or retort, and consequently the products evolved external of the smaller or inner retort are conducted by such tubes into the smaller retort or vessel, by which the hydrocarbons and the products evolved therefrom will be caused to pass through very extensive heated surfaces before the gas thus obtained is conducted away out of the apparatus for use by the outlet pipe rising from the smaller retort or vessel."

[Printed, 4d. No Drawings.]

A.D. 1861, November 25.—N° 2962.

HALFORD, JOHN.—(*Provisional protection only.*)—"Improvements in collecting and utilizing smoke, gases, and such like products of combustion, rendering the same available for heating steam boilers and other purposes where heat is required, which improvements are also applicable to the desulphurization of coal in making coke."

Instead of the ordinary chimney, a chimney is built which is closed at the top and is encircled at the sides and at the top with holes. This solid chimney is enclosed in an ordinary one. The outer chimney has the effect of drawing off the smoke and other products of combustion and conveying them to the holes near the top of the solid chimney, through which they descend to an underground pipe, by which they are conducted to the place where the heat discharges itself into a main flue. "From the increased draught caused by this means of burning coal into coke, the

"sulphur is more effectually extracted from the coke than by the ordinary method."

[Printed, 4d. No Drawings.]

A.D. 1861, December 27.—N° 2986.

BRAMBACH, HERMANN.—(*Provisional protection only.*)—"A new mode of manufacturing gas for illuminating purposes."

This invention consists "in passing hydrogen gas, prepared in the usual manner from sulphuric acid diluted with four or five times its bulk of water and fragments of zinc or iron, through a vessel containing some easily volatilized hydrocarburet, such as benzine or the essence of turpentine. The hydrogen combines with a portion of the carbon of the hydrocarburet, and thus forms a gas suitable for illuminating purposes, which gas may either be passed into a receiver or direct to the place where it is required for illuminating."

[Printed, 4d. No Drawings.]

A.D. 1861, November 27.—N° 2993.

OHREN, MAGNUS.—(*Provisional protection only.*)—"An improvement in the manufacture of gas and the apparatus connected therewith."

"It being a known fact that although a gas exhauster working at level gauge draws off a considerable portion of the gas produced in a retort, still a pressure is maintained in the retort equal to the seal of the dip pipe, from two to four inches, and that consequently a large portion of gas is destroyed in the retort." To remove this pressure from the retort a movable disc is used whereby the water in the hydraulic main is kept at one uniform level, just sufficient to seal the pipe when the retort is at work. The disc can be raised or lowered most effectually by the use of a screw and wheel, with a pointer attached to show the lineal opening. On the movable disc being lowered the water from the hydraulic mains will flow away, and the pressure will be removed from the retort to such an extent that the whole of the gas evolved can be drawn off by the exhauster at level gauge. It will be necessary, when the exhauster is stopped, to raise the disc so as to give the full seal in the hydraulic main, otherwise the back pressure will unseal the dips, and allow the gas to pass down the ascension pipes when the retorts are being withdrawn.

[Printed, 4d. No Drawings.]

A.D. 1861, November 23.—N° 3004.

VON KANIG, WILHELM ADOLPH.—(*Provisional protection only*).—Improvements in stoves or fire-places “for economizing fuel, and igniting same.”

At the back of the grate is fitted an elbow pipe through which the products of combustion pass off, and round this pipe is fitted a larger pipe, into which cold air enters from below and escapes heated through apertures in the front. A metallic screen is fixed in front of the fire. The fuel is lighted by means of a gas jet supplied by a jointed pipe.

[Printed, 4d. No Drawings.]

A.D. 1861, December 5.—N° 3052.

COCHRANE, JAMES.—“Improvements in wet gas-meters.”

This invention relates to a peculiar arrangement “whereby the ordinary existing meters, as well as the new meters constructed according to this invention, are made to comply with the requirements of the Sale of Gas Act.” This is effected by surrounding the present float of the gas inlet valve by a box or partition so as to separate it from the ordinary water chamber of the meter, and to insert the lower end of the water supply pipe into this box or float chamber “in lieu of into the main water chamber as heretofore; by this means the smallest quantity of water, which may be extracted by a syphon or otherwise through the water supply pipe, will instantly affect the position of the float, and cause the gas to be shut off without affecting in the slightest degree the proper water level in the measuring chamber.”

[Printed, 6d. Drawing.]

A.D. 1861, December 6.—N° 3058.

BAILEY, JOHN, and BAILEY, WILLIAM HENRY.—“Improvements in apparatus for indicating the pressure of steam and gases, the amount of vacuum, the flow of fluids, the weight of materials, and the speed of bodies either revolving or traversing, and also the employment of aluminium or its alloys in the manufacture of the same.”

The invention consists—1. In the application to steam pressure or weight gauges of a knife-edged pivot attached to the weight or its equivalent, so as to act as a lever. The ordinary india-rubber

or metallic diaphragm acting against the piston is employed as usual. The piston and weight are connected by a link having at the bottom a semicircular bearing, upon which the knife-edge pivot rests, so that when the piston rises or falls, the pivot has a delicate motion on the bearing with very little friction. 2. In the application to spring gauges of a regulating arm or lever, connected by a rod or link to the piston, the top of which is in contact with the spring. 3. In the employment of a lever in heat gauges and steam and water traps. The end of the lever is in contact with the flange of a short copper, aluminium, or other metal tube, through which the steam or water passes. The contraction or expansion of the tubes operates upon the lever, and in heat gauges it indicates, by means of a wheel and pinion with index hand, the heat or temperature, and in steam or water traps the lever shuts and opens a valve, which lets off the steam or water according to its heat or temperature. 4. In indicating the speed of any revolving or traversing body by means of a pair of ordinary governor balls put in motion by the shaft or body required to be indicated. To the sliding piece of the governor is attached a rod, and when the sliding piece rises by the action of the governor balls the rod presses against a lever attached to a wheel gearing into a pinion and finger, or in applying to the shaft of the ordinary registering apparatus a ball or universal joint, to enable the indicator to be actuated either by a vibrating or revolving motion. 5. In the employment of papier mâché in the manufacture of dials and cases, and also of aluminium or its compounds or alloys for diaphragms, screws, or other parts to prevent oxidisation.

[Printed, 1s. Drawings.]

A.D. 1861, December 16.—N° 3090.

ALEXANDER, HECTOR.—“Improvements in turning apparatus
“for making gas-burners.”

The object of this invention is to make the operations partly self-acting, and generally to facilitate and increase the rapidity of the manufacture. The rod to be shaped into burners is held and rotated in an ordinary headstock. Three or more tools are brought to bear upon the rod, one shaping out the outside, a second finishing it, and a third boring out the interior. “The
“holder of the first tool is made capable of a slight movement
“inward and outward, whereby the diameter of the burner is

“ varied, and is mounted upon a slide which moves on guides parallel to the headstock. As the burner is being gradually turned down into shape, this slide is made to move along by means of a weight or weighted lever which is put back at the termination of the operation, and restores the tools to the starting position. At the back part of the tool-holder there is a small antifriction pulley which bears against a pattern guide, and it is the shape of this guide which determines that of the burner. This pattern guide is centred on a pin so that it can be moved out of the way whilst the tool is moved back, and it is put into acting position by a lever being held and supported there by a second lever or stop held up behind it by a spring. This last stop lever is put down to allow the pattern guide to move back when required by an arm fixed to the tool-holder slide. The finishing and boring tools are carried by an arm or bracket jointed to the tool-holder slide in such a way that they can be turned over out of the way.”

[Printed, 6d. Drawing.]

A.D. 1861, December 11.—N° 3108.

TOOTH, WILLIAM HENRY, and YATES, WILLIAM, the younger.—“Improvements in the manufacture of iron and steel, and in the machinery, apparatus, or furnaces used therein, and for the production of gas to be employed in such manufacture.”

This invention consists—1. In constructing the floors of reheating furnaces of a corrugated form. 2. In the use of a ferruginous and aluminous composition for making the bricks, linings, and other parts of furnaces for manufacturing iron and steel. 3. In certain apparatus for the production of gases to be used in the manufacture of iron by being blown into or on to the molten iron through tuyeres. The apparatus consists principally of a large close chamber provided at the bottom with a perforated false bottom or perforated tunnels, on the top of which is charged carbonaceous matter, such as coke or charcoal mixed with alkali. Air is conducted through a suitable opening provided, if required, with a regulating valve, to a chamber or fireplace filled with incandescent fuel, whereby the oxygen contained in the air will be consumed, decomposed, or arrested. The gases or air thus modified by the action of the incandescent fuel will then be driven by the blast under the perforated floor or into the perfo-

rated tunnels of the large chamber, and after rising up through the carbonaceous matter the air or gases are conducted by an exit pipe to a gas holder or force pump and forced along, "whereby they may be forced along suitable supply pipes to the tuyeres of the cylinder or puddling furnace. This gas may also be applied to the blast furnace or reheating other furnaces where a blast may be required to reduce iron from the ore, or to refine impure or crude metal."

[Printed, 1s. 4d. Drawings.]

A.D. 1861, December 13.—N° 3141.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Felix Alexandre Testud de Beauregard.*) — "Improvements in blowers or apparatuses for superheating steam and other gases, and for projecting them combined with atmospheric air upon ignited combustible matter."

This invention "relates to the generation and employment of dry and superheated steam at a temperature of about 390° Fahrenheit, or of a gas, fixed or not, the pressure of which shall be equal to what may be necessary for the particular application for which it is to be used. This steam or gas is caused to escape from an orifice by virtue of its compression into another orifice calculated according to the quantity of air required in a given time. The mixture of steam or gas and air is projected upon ignited combustible matter. There is then produced the phenomenon of double decomposition. The air yields its oxygen to the combustible matter to assist its combustion, and the steam already divided will become decomposed into oxygen and hydrogen, so as to produce the highest combustion." The apparatus for putting this invention into practice is termed the "aerhydric blower," and consists of a superheating vessel placed in and across a furnace, and having in it horizontal steam tubes, while other vertical tubes allow of the gases and products of combustion passing through them. The steam becomes superheated while traversing the horizontal tubes, and issues through an outlet pipe, the nozzle of which enters a tube, the mouth of which is funnel-shaped. The section of the outlet pipe is calculated according to the quantity required in a unit of time, the distance of the nozzle from the mouth of the funnel varying with the increase of the pressure. The mouth of the funnel is also

calculated according to the quantity of air to be introduced concurrently with the steam or gas in the same unit of time; the smallest opening is a section which will allow of the addition of the quantities of air and of steam or gas which are to be projected under the pressure necessary to the combustion to be obtained. There are cups in the superheated vessel containing metals or alloys of different degrees of fusibility which answer as pyrometers.

[Printed, 8 $\frac{1}{2}$. Drawing.]

A.D. 1861, December 19.—N $^{\circ}$ 3184.

WELLS, JOSEPH HENRY GEORGE.—“Improvements in the method of, and apparatus for, pumping elastic fluids.”

The inlet and outlet chambers of a cylinder divided vertically are partly filled with water. In this cylinder are four tubes, two for the inlet and two for the outlet. One of the former is at one end connected with the retort, and the other is immersed in the water of the inlet chamber; the other is also connected with the inlet chamber, and extends above the cylinder. Of the outlet tubes, one enters the water, while the mouth of the other is above the surface. Another cylinder larger than the former, but connected with it so that water is contained between them, is worked by a piston or iron vessel open at the bottom and working in guides. On the last-mentioned cylinder rising, a vacuum is created in the inlet chamber, which is immediately filled with gas from one inlet tube, while the gas passing up the other fills the piston or iron vessel, and on the downward stroke of the piston the gas which is in the same, not being able to make its escape through the inlet tube by reason of the water which forms a valve, is necessarily forced through one of the outlet tubes, and rising through the water into the outlet chamber, is conducted through the other outlet tube into the gas holder.

[Printed, 8 $\frac{1}{2}$. Drawings.]

A.D. 1861, December 21.—N $^{\circ}$ 3208.

WILLIAMS, WILLIAM MATTIEU.—“An improvement or improvements in treating coal and other bituminous minerals and peat in order to obtain solid and liquid hydrocarbons therefrom, and in apparatus to be used for that purpose.”

The object of this invention is so to distil these matters as to increase the solid and liquid in proportion to the gaseous or less

valuable products. By conducting the distillation in the following manner, the overheating of the condensible products is prevented and a larger supply of them obtained. The retort descends through the bed of the furnace within a jacket or casing. The lower part of it, which projects below the bed, is funnel-shaped and terminates in a pipe. The top is open and fitted with a lid, which is tightly luted during distillation. The fire plays round the jacket and upon the lid of the retort. The products of distillation descend to the lower part of the retort, and rapidly pass from the heated part and solid contents of the retort. The vapours generated are condensed by jets of water on the part of the retort below the bed of the furnace. If the distillation is conducted at atmospheric pressure, the terminal pipe of the retort is open and the condensed products run therefrom; if at a greater or less pressure, the bottom of such pipe is closed by a valve weighted so as to give the required pressure (as described in No. 36, A.D. 1861), and connected with an exhaust pump.

[Printed, *8d.* Drawing.]

1862.

A.D. 1862, January 1.—N° 14.

DAVIS, EDMUND FRANCIS.—“Improvements in gas burners.” These are as follows:—“the lower part of the burner consists of
“a receptacle containing charcoal, above the charcoal a perforated
“cover or disc having its edge furnished with a screw thread
“(immediately below which is a gauze wire to prevent the charcoal stopping up the perforation) is screwed down inside the
“receptacle, which has a corresponding thread cut therein, so as
“to form a cap and force down the charcoal as may be required
“according to the pressure of the gas. The upper part of the
“burner consists of a dome and a nipple screwed thereon. The
“interior of the upper portion of the dome being furnished with
“a double layer of wire gauze, a similar duplicate layer being
“placed in the lower portion of the burner beneath the charcoal.”
“The dome is screwed on the lower part of the burner, and the
“whole is then ready to be attached by a male or female screw
“at the bottom of the burner to the gas pipe.” The gas passes

" through the layers of gauze and through the charcoal and
" perforated disc into the dome and through the upper layers of
" gauze into the nipple, becoming in its passage not only purified or rendered smokeless and increased in its illuminating
" properties, but regulated in its pressure and its consumption
" proportionately economised."

[Printed, 4d. No Drawings.]

A.D. 1862, January 1.—N^o 17.

GUTKNECHT, JOHN JACOB.—"Improvements in meters for
" measuring gas, water, and other fluids." Although the apparatus which is the subject of this invention is like the meters of Kennedy, Donnet, and others based upon the principle of the piston pump, "in which the water works, in a similar manner as
" in the Ferrar hydraulic machines," it was necessary to depart
" from the principle" of the aforesaid meters in order to work with the least possible pressure. Instead of using a packed piston working in a cylinder, by the action of which considerable friction took place, a diaphragm bolted between two discs, but free at its exterior portions to vibrate on each side of its fluid tight joint with the middle of the cylinder is employed. The working of the cylinder is divided transversely, into two measuring chambers by means of a diaphragm; the gas, &c. to be measured is admitted alternately and suddenly on each side of the diaphragm by means of a slide valve, valve box, and ports similar to those of a steam engine. By this arrangement a measured quantity is continually admitted into the outlet passage from alternate sides of the diaphragm. To effect the sudden change of the piston of the slide valve at the completion of the stroke of the diaphragm, the main piston rod is connected, by means of a circular rack and toothed wheel, with a cranked axle that acts upon the slide valve piston rod by means of "elastic rubber" springs a projection on the wheel suddenly setting the springs free. Ratchet claw-knives (furnished with suitable springs) convey the motion of the lever of the circular rack to the wheelwork of the registering index. The main piston rod has a cap of leather or flexible diaphragm at its entrance into the cylinder, it also rests in a bearing at its exit from the cylinder, friction is thus reduced as much as possible.

[Printed, 1s. 8d. Drawings.]

A.D. 1862, January 4.—N° 37.

WARNER, ARTHUR.—(*Letters Patent void for want of Final Specification.*)—"Improvements in preparing materials for and in
"purifying coal gas." These are "employing in the purification
"of coal gas, the cinders or oxide of iron obtained from puddling
"reheating and refining furnaces used in the manufacture of
"iron, and which are now for the most part waste products in
"such manufacture." To render these materials "suitable for
"the purification of coal gas, such oxide materials or cinders, are
"ground to reduce them to powder, and are then washed in
"water. The prepared materials are used in apparatus such as
"are employed when purifying gas by what are known as the
"dry processes."

[Printed, 4d. No Drawings.]

A.D. 1862, January 9.—N° 61.

BRUNT, JOHN.—"Improvements in gas meters." These are
first, "the rise of a compound float, or the combined action of
"floats" as follows "for working the inlet valve." It is stated
that "many different modes of construction may be adopted for
"carrying out this," but three modes are described "all of which
"consist in the use of two floats attached to the valve stem, and
"having a common vertical movement, the box containing the
"floats being divided into two parts or chambers by a partition
"descending under the surface of the water between the two
"floats; one of these chambers receiving the inlet gas before its
"passage into the drum of the meter, whilst the other chamber
"is in communication with the outlet gas which has passed
"through the drum of the meter. By this arrangement as the
"variations of the water level in the two chambers always take
"place in contrary directions, that is to say, that a depression of
"the level in one chamber always corresponds to a nearly like
"elevation of level in the other chamber, it follows that the
"position of the floats or compound float is but slightly changed
"by the variations of level in the two chambers, and in con-
"sequence that the inlet valve can be adjusted with much
"greater precision without fear of the disadvantages appertaining
"to the ordinary system of gas meter."

Second, "the means employed for drawing off the overflow
"water from the syphon pipe." It is stated that hitherto this

has been effected "by removing a plug or screw whereby after the "passage of the water the gas can be extracted without being "registered on the dials;" and to obviate this evil a plug or screw is used "to which a rod is attached on the upper point of "which a weighted lever is supported. On withdrawing the plug "for the passage of the overflow water the weighted lever depresses the float, which bringing the valve home on its seat, "intercepts further passage of gas until the plug is returned to "its former position."

[Printed, 8d. Drawing.]

A.D. 1862, January 9.—N^o 67.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Léon Farrenc and Henri Gloesener.*)—"Improvements in apparatus "for carburetting and burning gas." These are first, "the "employment in apparatus for carburetting and burning gas of "a wick and burner, the said wick being protected and capable "of absorbing and raising the carburetting liquid."

Second, "the employment of a current of air between the "carburator and the tube leading to the burner."

Third, "the employment of two currents of gas, one of which "is carburetted" while "the other is ordinary coal gas and passes "direct to the burner where both currents are consumed together" as follows. A vessel containing naphtha or other liquid capable of carburetting gas, is placed inside or outside a lamp according to the nature of its construction or to the position it has to occupy; the spindle of a gas burner "passes through the carburetting vessel, the upper part of which is tubular, and space "is left all round between the spindle and the tube." Surrounding the spindle in the vessel is a wick "made of felt "cotton, amianth, or other suitable material, the lower portion "of which enters the carburetting liquid." A tube leads from the gas pipe or spindle outside of and below the vessel into the upper part of the vessel, whereby gas is led into the vessel, which pressing on the liquid contained therein drives the liquid up the wick and the gas following they become mixed and are consumed together at the burner. The wick is protected from contact with the flame by an oval or circular plug pierced with holes or with a saw cut. "A portion of the gas to be consumed flows up the spindle to the burner in the ordinary

"manner." "A current of air flowing between the gas supply tube and the carburator assists combustion." Two other lamps fitted with a carburetted apparatus, the arrangement of which are somewhat modified from the above, are described.

[Printed, *8d.* Drawing.]

A.D. 1862, January 13.—N^o 90.

WARLICH, FERDINAND CHARLES.—"Improvements in the manufacture of artificial fuel." These are, in reference to this subject first, "the application of the gases evolved during the distillation of coal to the heating of carbonizing ovens in which block fuel is subsequently baked."

Second, "the application of the gases evolved during the torrefaction of coal to the heating of the torrefiers, retorts, and carbonizing ovens."

The retorts preferred are "hermetically closed by properly luted doors, and composed of fire-bricks with fire-tiled bottoms, and heated on one or more of their sides by means of fire-places provided with suitable flues, the gases being drawn off" by a fan or other exhaust, and conveyed under the torrefiers "when they are consumed by means of jets forming a fire placed for the purpose of affording the necessary heat." Between the retorts and fire-place "the gases traverse refrigerators in which the tarry products are condensed." The permanent gases may also be used for the purposes of heating the ovens or they are otherwise employed. "The tarry vapors or gases obtained [from the torrefiers are exhausted by suitable apparatus, and the latter employed either as fuel under the torrefiers themselves, or for the purpose of heating the retorts." The torrefiers preferred are long and shallow brick retorts, either with or without moveable scrapers." As the amount of gas evolved varies "it is necessary to arrange such a series of retorts and torrefiers as will afford a continuous supply."

[Printed, *4d.* No Drawings.]

A.D. 1862, January 15.—N^o 113.

CLELAND, WILLIAM.—"Improvements in treating and utilizing certain materials used and products obtained in the manufacture of gas, and in apparatus connected with the said

"treatment." These are, first, "the use of ordinary horizontal gas retorts" for "distilling or subliming off the sulphur from the spent oxides of iron that have been used for purifying gas, with the exception of the magnetic oxide and carbide of iron and spathose iron ore." "This exception does not relate to any of the claims hereinafter stated." "The distillation or sublimation of sulphur from spent oxides as above by means of vertical or inclined retorts in which the process, if desired, may go on continuously, utilizing by distillation and sublimation the ammonia or ammoniacal compounds contained in spent oxides of iron," "the use of waste heat from the arches or ovens of gas retorts for the above-named purposes;" "the direct production by distillation and sublimation of roll or stick sulphur and flowers of sulphur from spent oxides of iron."

Second, "the extraction of sulphur from spent oxides of iron by fusion and pressure."

Third, "the extraction of sulphur from spent oxides by digestion" in "hot oil, hot caustic potash or turpentine," the sulphur is separated by "agitation, subsidence, and decantation." The crystals are thrown on a filter, &c.

Fourth, "the extraction of ammonia and ammoniacal compounds from spent oxides of iron by lixiviating with water."

Fifth, "the production of sulphurous acid gas from spent oxides of iron by self-sustained combustion" and "the utilization of the ammonia given off by spent oxides of iron while burning" by cooling, by a porous material, or by other suitable means or apparatus placed "in the passage of the gas."

Sixth, "the production of sulphates of iron directly from spent oxides of iron;" when heated with limited access of air, a temperature of about 600° F. answers well; but "a dull red heat and much higher heats may be used." The production of sulphides of iron by heating in the absence of air, such spent oxides of iron as do not yield free sulphur by ordinary distillation or sublimation. The production of "sulphides of iron from spent oxides of iron by mixing the latter with metallic iron minutely divided and water." The production of sulphides of iron from spent oxides of iron by adding metallic iron and fusing the sulphur in the mixture. The use or "application of any or all of the sulphides" "as obtained under the first and the sixth head, for the production of sulphates of

"iron." "The application of spent oxides of iron for the manufacture of sulphate and sulphite of ammonia" by exposing them in various ways to air, steam, &c.

Seventh, the use of spent oxides of iron "for the manufacture of sulphate of alumina and alum either directly or by previous conversion into sulphide of iron or into sulphate of iron."

Eighth, "the use of spent oxides of iron for the manufacture of sulphate of soda, sulphuret of sodium, and carbonate of soda, either directly or by conversion into sulphide of iron or into sulphate of iron."

Ninth, "the use of the oxides of iron and other materials resulting from the foregoing processes under the first, second, third, fourth, fifth, sixth, seventh, previous and eighth heads for the manufacture of pigments."

Tenth, "the use of the residual oxides of iron from the second, third, fourth, and sixth heads." "Also the use of the crude sulphate from the sixth head for the purification of gas."

"The use of the burnt oxides of iron from the fifth, eighth, and ninth heads (when any is available from the latter) for the purification of gas."

Eleventh, "utilizing the ammoniacal vapours given off by oxides of iron undergoing revivication, substantially as follows, by passing a gentle current of air through the revivifying materials, and afterwards passing this charged air through any porous material that will absorb the ammonia."

[Printed, 1s. 6d. Drawings.]

A.D. 1862, January 18.—N° 136.

TICE, WILLIAM. — (*Provisional protection only.*) — "Improvements in gas regulators and meters, part of which invention is also applicable for covering various descriptions of metal spindles." These are, first, "soaking such flexible diaphragm of whatever material it may be composed in glycerine or other like substance, and afterwards coating such diaphragm with a mixture of treacle and glue, or other saccharine and animal matter, reduced to a proper consistency for the purpose of preserving the flexibility and filling up the pores."

Second, for all gas regulators, &c., in which "metal spindles are used, travelling in or through some description of metal, making such spindles of or covering them "with glass, porce-

"lain, or other like material," and also inserting "in the cover, or in such part of the instrument in which the spindle should work, a tube of glass, porcelain, or other like material," and also making the valves of or covering them "with porcelain or other like material," or coating "the valves and valve seats with an alloy of silver or other non-corrosive substance."

[Printed, 4d. No Drawings.]

A.D. 1862, January 28.—N° 217.

HUNT, JOHN. — "An improvement or improvements in the manufacture of gas and other chandeliers." These are, first, "constructing the framing of gas and other chandeliers of square or angular tubing," by binding these tubes "into such forms that when they are symmetrically arranged about a common axis, they form a skeleton or framing of the general figure which it is intended the finished chandelier shall have. The tubes are fixed together by screwing or brazing, or otherwise; and the chandelier is finished by the addition of such ornamental or other parts as the particular design of the chandelier may require."

Second, suspending or balancing chandeliers having a framing of angular or other tubing, by means of a single balance weight situated within the framing and connected to the chandelier by two or more chains." The balance weight is situated within a framing of tubes, and has a hole in its axis through which a central tube passes which supplies the gas.

[Printed, 8d. Drawing.]

A.D. 1862, January 31.—N° 257.

SCHATTEN, HERMANN. "Improvements in the manufacture or construction of gas meters." These are as follows:—In a cylinder of sheet metal, resting upon its own periphery, and divided by a fixed partition, a pair of drums move independently on their axes, the said axes being central and in the same straight line. Both drums are opened by a "cuniform" incision in their two lateral "walls at the same part;" the upper side of the opening is closed, the lower side is left open to allow of the preservation of the level of the liquid within and without the drums. An opening at the bottom of the partition enables the liquid in each compartment to attain the same level. An annular gas pipe

in the interior of each drum introduces the gas below the "partitions" or lateral walls of the said incision; other openings conduct the gas above the "partitions." The motion of the drums is adjustable, and embraces only half a circle, thus measuring the gas uniformly independent of the level of the liquid. The slide valve of each drum is worked by the motion of the other drum; the axis of each drum being (for this purpose) provided with a crank and rolls. A regulator to avoid interruptions consequent upon excessive pressure, &c., consists of a float valve which prevents the access of gas when the level of the liquid is low. Motion is imparted to a registering apparatus of the usual description, by means of a catch pushed by the cranked axles of the drums, so that the said catch acts on an escapement. Glycerene may be used in place of water in this meter.

[Printed, 2s. Drawings.]

A.D. 1862, February 1.—No 270.

FAUVEL, LEON.—"Improvements in apparatus for indicating the existence of escapes in gas tubing, and for stopping the continuance thereof." These are, first, "providing the gas meter fixed on the gas tubing," with the arrangement described below, "for causing or not an alarum to be rung, and for causing at the same time a valve to shut the pipe by which the gas is allowed to enter into the meter, in order that whenever during the time the burners are not lighted an escape of gas should take place in the meter, or in that part of the tubing connecting this latter to the burners, this escape be stopped at once, and, if wished, indicated by the alarum."

Second, "providing the pipe leading from the mains to the gas meter with a supplementary meter" provided with a similar arrangement "for working or not an alarum, and for causing a valve to shut the said pipe whenever an escape of gas should occur in the tubing between the supplementary meter and the burners during the time the latter are not lighted."

Between the inlet and outlet pipe of the gas in an ordinary gas meter is an axis in connection with the measuring drum, which protrudes beyond the meter when it is provided with a wheel in gear with a pinion, which latter, together with a wheel fixed concentrically on the top of the said pinion, revolves round a vertical

spindle; the wheel last mentioned has four or more cross bars projecting horizontally beyond the periphery thereof, and on this periphery are also fixed a series of vertical pins; the spindle is fixed in a rule, which may be caused to turn on a screw bolt, in order to allow of bringing at pleasure the pinion in or out of gear with the first-mentioned wheel. The above pins act against the end of a hammer, and make the latter strike an alarum, and causes a weighted valve to fall into the inlet pipe for the gas, and so shut off the gas supply into the meter.

[Printed, 8d. Drawing.]

A.D. 1862, February 4.—N° 297.

WEBSTER, JAMES.—“Improvements in gas fittings.” These are, first, in nibs or burners cutting “the aperture for the gas in such direction that the flame jets out downwards and then rises upwards slightly in a mushroom form.” In the argand burner the holes are perforated “in a ring round the side of the burner instead of upon the top; the effect of this is that the air acts upon the flame immediately as it issues from the burner, and more perfect combustion is ensured.”

Second, “in the sliding parts of moveable pendants or gas-lights” employing the following means as “a substitute for the balance weights and chains connected to the ordinary water slide.” Upon the water cup a gland or stuffing box is secured provided at the top with a screw or nut for the purpose of tightening the parts.” Round the fixed tube wrapping loosely “a strip of thin metal or metal gauze overlapping the joint,” and in preference, using “for this purpose block tin in the form of thin sheets.” “Over this runner, and completely surrounding it,” placing “a short tube of vulcanized rubber acting with equal pressure all round the metal runner; the rubber keeps the metal runner always in immediate contact with the fixed gas tube.” A loose collar is employed to work upon the top of the india-rubber tube, compressing it, but without affecting the metal runner, and this loose collar is kept to its work by a screw and cup working into the stuffing box.”

[Printed, 8d. Drawing.]

A.D. 1862, February 7.—N° 328.

CLARK, WILLIAM.—(*A communication from Henri de Lapparent.*)
—“Improvements in preserving timber, which are particularly

" applicable to the timber of ships or other maritime structures." These are, first, "the method of extracting the sap from wood."

Second, "the methods of artificially or naturally drying wood."

Third, "carbonizing wood by the aid of a jet of inflammable gas of any suitable nature" under pressure, and which is "projected on the wood in position, which process is especially applicable in the hulls of ships," lighting gas may be used, but if not to be had, "hydrogen, or still better, carbonic oxide, and further, the preservation of the hulls of such ships by the application of a sulphurous paint" in order to prevent the formation of incrustations, said paint being applied on the "carbonized parts."

Fourth, "constructing the shells of vessels so as to admit of air passing along inside the framing, in order to prevent the stagnated heated air decomposing the timbers."

By a Disclaimer and Memorandum of Alteration, No. 328*, filed June 22, 1863, it is stated that these Letters Patent *are assigned to and vested in Edmund Goldsmid, Adrien Maydieu, and Henri de Lapparent*. It also appears that the first, second, and fourth improvements above are disclaimed, and also the second part of the third improvements relating to the further preservation of the hulls by a sulphurous paint is likewise disclaimed.

[Printed, *8d.* Drawing. Disclaimer and Memorandum of Alteration, *4d.*]

A.D. 1862, February 12.—N^o 371.

JOSEPH, JOHN STEPHEN,—“Improvements in coke ovens, and in utilizing the waste heat from the same.” These are, first, “the construction of coke ovens having external chambers at the top, and flues leading from these and surrounding the sides and bottom of the oven, into which the combustible gases enter and are there caused to undergo more or less complete combustion by being brought into contact with jets of atmospheric air which enter the said external chamber and flues, other jets of air being also caused to enter the ovens themselves for the same object.” In some cases perforating the bottom of the casing of the ovens where the flues pass beneath them, so as to admit a certain quantity of air into the bottoms of the ovens in which extra air passages are provided in the surrounding casings of the outer chamber, with small channels through which the air *required* for this purpose is admitted.”

Second, "the employment of the spare heat resulting from the above-described combustion of gases" in these coke ovens, "for generating steam in boilers, for making illuminating gas in retorts, for firing pottery, for heating drying stoves, for calcining ores, and for burning lime." When the hot products of the combustion arrive at the lowest portion of the flues underneath the ovens they pass through longitudinal flues and into a main flue at one end of the ovens, and from thence into another flue to be used for some of the above purposes. In some cases making use of this spare heat by placing retorts for making illuminating gas in the chambers above the ovens themselves.

[Printed, 8d. Drawing.]

A.D. 1862, February 13.—N^o 376.

JOSEPH, JOHN STEPHEN.—"The construction of ovens for making coke, charcoal, or other similar processes, by which combustible gases are disengaged, which ovens are constructed of such a transverse sectional form as to require little or no support from the sides, and which are completely surrounded, except at the ends, by a chamber in which the gases proceeding from the interior of the ovens are caused to undergo more or less complete combustion by the introduction of a number of small jets of air into the said chamber, other jets of air being also introduced into the ovens themselves at the top."

The inventor claims "the employment of the spare heat, generated by the combustion of the combustible gases" in his improved oven herein-before described, for raising steam in boilers, for making illuminating gas," and for other purposes.

[Printed, 8d. Drawing.]

A.D. 1862, February 13.—N^o 395.

VALENTIN, WILLIAM GEORGE.—"An improved mode of and apparatus for coking coal." This consists first in "coking coal in close chambers or retorts heated externally by the combustion of gases generated from similar previous coking operation."

Second, the use of vertical close chambers or retorts, in combination with the external flues or heating channels supplied with combustible gases and air from burners.

These chambers are, by preference, rectangular, long, narrow and deep, closed at top and provided with a hopper, &c., through which they are to be charged with coal. The bottom is moveable in form of a trap or sliding door, &c., which when let fall or opened will allow the charge after being properly coked to drop into a vacant space below. All the coking chambers are surrounded by narrow passages or flues into which the combustible gases, together with a supply of atmospheric air to supply combustion are introduced through suitable burners communicating with a supply pipe connected with the gas reservoir. To prevent the heat generated by the combustion of the gases passing off too rapidly, a number of partitions are placed in the flue. "The gases and vapours" evolved are conducted by pipes "to a receiver and condenser, where the tar and other solid and liquid matters may be separated from the incondensable gases, which are conducted to a gas holder, so as to be ready for heating retorts or coking chambers," or "for other purposes for which they may be usefully employed, as for lighting, heating, or for other purposes."

[Printed, *1s. 4d.* Drawings.]

A.D. 1862, February 18.—N^o 431.

CLARK, WILLIAM.—(*A communication from Pierre Duchamp.*)—(*Provisional protection only.*)—"Improvements in gas apparatus used for lighting cigars and other tobacco." This consists "of a hollow metal tube fixed to a handle by means of a socket. The lower end of the first tube carries a tube of smaller diameter, serving for the filtration and for the burner of the gas. The upper end of the hollow metal tube has a screw thread for the purpose of fixing a metal stopper therein, which is slightly filed so as to allow of a small jet of gas escaping between the tube and the stopper. This stopper has an opening in its centre, carrying a rod, having a valve at its lower part and a hook at the upper part. The valve is formed of several round balls forming a weight, which opens and closes hermetically the opening in the stopper. The hook at the upper part of the rod is attached to a cord of less length than that of an india-rubber tube which encloses the whole and serves to conduct the gas." From the foregoing "it will be understood that if the apparatus is suspended, the rod carrying the valve will be raised by the

“ short cord, and consequently the balls will close the orifice in the stopper, so that the gas jet can only escape between the first tube and the screw thread of the said stopper, while on the contrary, if the apparatus be raised the weighted ball valve will fall and afford a passage for a larger jet of gas than that which can pass through the screw stopper, when the tobacco may be at once lighted. The apparatus is then again let fall, causing the valves in rising to close the orifice in the stopper, so as only to have the smallest jet of gas burning which escapes through the former.”

[Printed. 4d. No Drawings.]

A.D. 1862, February 19.—N^o 439.

BARNETT, FREDERICK.—(*Provisional protection only.*)—“ An improved lamp or lantern for street lighting and other purposes.” This consists in constructing lamps or lanterns so as to have “ a better development of reflection of gas or other light,” “ the same to be obtained in conjunction ” with the Patentees “ enamelled reflectors, or with other apparatus in lieu thereof,” and with “ a regulated current of air, also an arrangement to light the said lamps without a ladder or a trap in the bottom of the lamps.” These lamps “ have a greater diameter in their upper parts near the covers or domes than have the ordinary ones,” and diminish rapidly towards their lower parts until they are reduced to less than one-third, and “ no larger than that part of the capital of the lamp post on which they are fixed, so as to cause little or no shadow.” In the base of the lantern is a glass neck descending one or more inches, large enough “ to pass the pipe supporting the burner, and enough air “ to feed the flame.” The tap for turning on or off the gas is between the lamp and the lamp post, and is capable of being opened or shut by means of a stick from below. In the upper part of the lantern is placed in its largest diameter an enamel reflector, having “ one or more oval or round holes according to “ the quantity and nature of the burners,” which are surmounted by conical chimnies six or eight inches high. For the purpose of lighting the gas, &c. “ from the footpath without a ladder,” the door of the lantern “ opens on a hinge placed on the upper part “ of the door.” On the lower part of the door is a piece of metal or bolt, which is made to shut “ into a spring catch fixed

"solidly on to the lower frame of the lantern." From this spring catch there extends "a spur some few inches, which when pressed back, causes the catch to relinquish its hold on the bolt," and thus the door will be opened. The lamp is ignited by a lighting staff.

[Printed, *8d.* Drawing.]

A.D. 1862.—February 19.—N^o 444.

DAVIS, WILLIAM.—"Improvements in increasing the illuminating effect of coal gas and other gases." These are first, increasing the illuminating effect of coal and other gases by means of "carburetting materials" "conveyed continuously from their receiver or holder, while the combustion of the gas under treatment is going on, to a receiver holder or part in such proximity to the burner" so that the heat produced by the combustion of the gas shall evolve vapours from the carburetting material, which "shall combine with the gas under treatment, and thereby increase its illuminating effect."

Second. The mode of effecting the above by "carburetting materials" contained in a holder below the burner, from which holder they are gradually raised to the neighbourhood of the burner by capillary action or other means, so that the heat transmitted from the burning gas shall evolve vapours from them, which combine with the gas, and increase its illuminating effect.

Third. The mode of applying threads of cotton or other fibrous materials for raising the carburetting materials, according to which the threads carried from the holder of the carburetting material are coiled or wound round in the neighbourhood of the burner for the purpose set forth.

Fourth. The mode in which the carburetting material is raised to the centre of the burner as above.

By carburetting materials are meant "enriching or auxiliary agents, such as hydrocarbons, mixtures of hydrocarbons, hydrocarbonaceous substances." When the holder or receiver of the carburetting agent is below the burner, the mode preferred for raising the hydrocarbon to the immediate neighbourhood of the burner to be there evaporated is by "capillary tubes, or worsted or cotton threads, or other capillary conductors or conveyers."

[Printed, *8d.* Drawing.]

A.D. 1862, February 22.—N° 484.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from Carsten Richard Meyn.*)—"Improvements in burners for heating by gas." These are first, "the application to gas burners for heating purposes of a regulating apparatus," afterwards described, "by means of which" "a due supply of atmospheric air may be mingled with the gas, and its introduction controlled according to the requirements of the combustion."

Second. "The application to such burners of a conical undulating or otherwise indented or moulded cap or diaphragm of metallic gauze" as follows:—

A threaded metallic socket is screwed to a pipe pillar, or other setting and fitted at the top with a common burner, a tube which surrounds the burner is fixed to the socket, and is "pierced with apertures for the admission of atmospheric air; the lower part of this tube is provided with a lining of coarse wire gauze of about 14 meshes to the inch, by which the air is divided and freed from foreign matters in its passage through the apertures above noted." A sliding collar surrounds the lower part of of this perforated tube, and is pierced to correspond with the apertures of the latter. This collar serves to regulate the admission of air. A small cone is fitted to the upper part of this perforated tube by a bayonet or other suitable joint and secures a cap of metallic gauze (of about 25 meshes to the inch) on the upper part of the said tube. This gauze cap is of a "conical, undulating, or otherwise moulded form (not flat)." "Another conical tube formed of slightly oxidable metal or other suitable matter" is set over the gauze cap in the upper part of the cone, beyond which it projects about half an inch. There is a capsule of the same material placed over the cone, with a diameter narrowed at top to suit the flame when it is reduced.

[Printed, 10d. Drawings.]

A.D. 1862, February 24.—N° 485.

JOHNSTON, WILLIAM.—"Improvements in gas and other lamps and stoves." These are, "contriving, forming, shaping, or arranging of the details of lamps and of gas-stove burners" as follows:—First, in lamps for illuminating shops, halls, stations, &c., and which are of the kind comprising a number of gas jets or other lights arranged star-fashion, or in a circular or similar

form, beneath, above, around, or partly around a central reflecting surface or combination of reflecting surfaces, and comprises various improvements in contriving, forming, shaping, or arranging the details of such lamps.

Second, in spherical and such like shaped reflectors, "forming the reflecting surface with a series of flutings, so as to present an indented outline in section, instead of the ordinary circular outline, and in disposing the lights so as to obtain a multiplication of reflections from such flutings." Another modification of such reflectors is forming them "of transparent glass, having a thin surface, coating, or enamel of coloured or opaque glass. The glass is silvered internally, and indentations are cut on the external surface through the coating or enamel, so as to present ornamentally-shaped reflecting portions."

Third, in constructing reflectors of forms which are convex in general outline at the reflecting part, polished metallic surfaces are employed, as thin sheets of copper silvered, &c., and protected by a vitreous coating, or a coating of lacquer or varnish. When cheapness is an object, tinned plate or zinc may be employed in place of the copper silvered, &c.

Fourth, "various combinations of what may be termed geometrical reflectors." In one, "two flat reflecting surfaces are fitted angularly together, and are disposed so that a flame presented at or near the angle will produce a multiplied appearance on the principle of the kaleidoscope." In another, "arranging plates, having reflecting surfaces on both sides, so as to radiate outwards from a central vertical axis, or the plates may be disposed so as to be tangential on plan to a circle of moderate radius." Instead of arranging reflector lamps with a single pendant reflector and a set of burners, having two or more separate branches with reflector lamps from a central pendent pipe.

Fifth, "to increase the ornamental effects of the various reflector lamps," obtaining "a rotary motion of the reflector, of the circle or circles of flames or of both." In the case of reflectors the motion is obtained "by mounting them on a pivot or otherwise, so as to turn freely, and by applying to them inclined vanes," which will be acted upon by "the upward current of air caused by the flames, so as to produce the rotation." In the case of gas jets the radiating branches are fitted to an inverted cup or closed tube, which tube is mounted on a pivot

fitted into the top of the gas pipe, and dips down into an annular recess formed on the gas pipe, and containing a liquid which forms a gas-tight joint. The rotation is obtained either by inclined vanes attached to the branches or centre tube, or by arranging the gas jets all in one direction of rotation.

Sixth, the imparting of a rotatory motion as above to gas jets used for heating purposes as in gas stoves. "Provision is made for mixing air with the gas prior to its combustion, as in the well-known Bunsen burner, and no liquid joint is required."

[Printed, 8d. Drawing.]

A.D. 1862, February 24.—N° 495.

DAVIS, LEWIS, and PARKES, FREDERICK MAJOR.—"An improvement in the production or manufacture of gas for lighting and heating." This consists in "the manufacture or production of a gas from petroleum in a retort or similar receptacle, by subjecting it (the petroleum) to the action of heat which gas shall be capable of being stored and conveyed and distributed in a gaseous state for lighting and heating in the same way as the common coal gas now is." A shallow retort is placed in a furnace and heated, is charged with petroleum, whereupon gas will be evolved. The heat preferred is from 1700° to 2000° Fahrenheit. The gas passes through the hydraulic main into ordinary condensers, and purifiers supplied with lime and water or other purifying agents, and thence into a gas holder. Instead of a retort it is run into a bent tube through a feed pipe, and exposed in passing to a heat of from 1700° to 2000° F., it rises into a second limb of the tube, where it meets with the same temperature as in the first limb, and travels as gas to the upper part or end of the limb and passes to the main and purifiers. "A similar effect may be produced by using a double vertical retort consisting of two chambers communicating by a bent pipe."

[Printed, 4d. No Drawings.]

A.D. 1862, February 25.—N° 499.

CARNABY, JOHN.—"Improvements in turning, managing, and regulating the taps and valves of gas pipes." These are said to be first, "the mode of figuring and dividing the dial plates to indicate the number of burners which the proportion of gas admitted by the tap or valve will be sufficient to supply."

The dial is divided "either into proportionate parts of the supply, " shewing by figures and spaces the degree the tap or valve is " turned on," or it is shown "by figures and spaces on the dial " the number of burners that the supply of gas passing through " the tap or valve is sufficient to supply."

Second, "the use of a pillar or pipe fastened to the floor, by " which means the lines are taken from the regulator and carried " to the tap or valve."

Third, the making of the regulator of a piece with the said pillar or pipe.

Fourth, "encasing the tap or valve." "If the tap or valve " is to be turned on and off at the place where it is fixed in the " pipe," there is placed over the tap or valve a case or regulator, and the plug of the tap or screw of the valve is turned with a key fitting the square of the tap or screw of the valve.

Fifth, "the mode of weighting and unweighting self-acting " gas regulators or governors." There are four weights "which " may be lowered one by one on to the cap or holder of the self- " acting regulator or gas governor." The weights on the line or chain of the self-acting regulator "are kept at proper distances " from each other by pieces of lead fixed on the line under each " weight, in the manner shots are attached to fishing lines, or by " pins placed in the lines." There are two upright wires or rods fastened to the cap or gas holder, which pass through holes in the weights to guide them, or if the weights are to press only on one side, one of the rods is dispensed with. The line or chain above referred to may be carried to any part of the house, and raised and lowered as described in No. 452, A.D. 1852.

[Printed, 8d. Drawing.]

A.D. 1862, March 1.—No 555.

SIM, JAMES. — "Improvements in the construction of gas " meters." These are said to be first, the construction and arrangement of the syphon overflow pipe, as and for the purposes afterwards described.

Second, the arrangements and combinations of apparatus and mechanism in the construction of gas meters as follows :

The principle upon which these meters are constructed is in causing the gas to come in contact with a large surface of water in " a separate vessel or vessels " whereby it "becomes saturated

" with moisture previous to being admitted into the measuring compartment of the meter, and thus preventing the absorption of the water contained therein by the gas. In constructing a meter the front box " is divided into two compartments, one above " the other, the upper compartment containing the usual arrangements of valve, float, index, spindle, with the necessary gearing " to the measuring cylinder or drum, the pipe for supplying " water to the meter, and also the syphon overflow pipe " afterwards described " for adjusting the water line of the meter while " the lower compartment is used as a cistern or reservoir for holding water the same being provided with an overflow pipe for " the exit of any surplus water." The gas after passing over the water is conveyed in a hydrated state into the hollow covering of the measuring cylinder or drum. Any surplus water thus carried into the measuring compartment of the meter may be returned to the cistern or reservoir by a syphon attached to the inlet pipe before the latter enters the hollow covering of the measuring cylinder or drum, the head of such syphon pipe being the water line of the meter. In filling the meter with water it rises in the syphon pipe, overflows the head, and runs down the lower part of the inlet pipe into the cistern or reservoir. The lowest compartment may consist of two reservoirs or of trays containing water ranged one above the other.

[Printed, 8d. Drawing.]

A.D. 1862, March 1.—N^o 571.

BOWEN, HENRY.—"Improvements in gas meters." These are said to be "the general construction and arrangement of parts " forming a compensating gas meter having a square frame and two " chambers." "The arrangement and mode of constructing and " adapting the valve box direct to the chamber of communication." "The mode of constructing the float and adapting it " to the valve." The mode "of compensating for loss of water " in wet gas meters by evaporation or otherwise by means of a " fountain or chamber;" and "attaching the overflow pipe, to " stuffing box pipe, which admits air or gas into the fountain" as follows. "The square frame or front chamber of the meter " is divided into two compartments, consisting of a reservoir and " chamber of communication to the interior or drum chamber. The " supply of gas goes direct from the inlet to the chamber of com-

"munication from whence it passes to the measuring drum. The vertical overflow pipe extends nearly to the top of the reservoir, and communicates with the lower chamber, and also acts as an air pipe. The overflow pipe is attached to the pipe which surrounds the upright shaft or spindle leading to the index," or it may be fixed in any other part of the reservoir. "Its lower end or opening corresponds with the water line which it is desired to maintain in the meter." "A syphon or orifice in the reservoir is one of the means of communication with the interior or drum chamber of the meter." When the water in the meter descends below its proper level, it leaves exposed the lower end of the overflow pipe, and the inlet pressure of the gas allows the gas to ascend through the overflow or air pipe. "The water from the reservoir passes through the orifice or syphon to the drum chamber until the water attains the correct level, when the overflow pipe will be again sealed." The float is placed so as no pressure will affect it and the valve of the gas inlet will be closed when the water reservoir is empty. "The float has a cylindrical hole made through it, and inside this is a tube made gas-tight at the top by means of a screw, which secures it to the valve seat. The tube and float are submerged in the water in the reservoir. Across the under side of the float is a bridge piece, and a weight is attached to the valve rod to bring back the valve to its seat when the float sinks." The gas entering the meter "passes along a pipe or channel provided for the purpose, and is conducted to the communication chamber; the inlet valve being attached to the float." "The valve of the inlet pipe is placed outside the square frame or front chamber, so as to be easy of access for repairs, and is placed above and lifted by the float." "It is also so placed and protected by a cover that the rush of gas shall not impinge directly upon the top of the valve and effect its operation. The overflow box under the square frame is formed of one chamber."

[Printed, 10d. Drawing.]

A.D. 1862, March 3.—N^o 577.

TEVENDALE, ANDREW.—(*Provisional protection only*).—"Improvements in the apparatus used in connection with cooking stoves and domestic fire-places for the manufacture and supply of gas." These are distilling coal or cannel, but in preference

"common coal mixed with a small quantity of lime or oxide of iron in an ordinary retort," placing the retort "in such a position that the waste heat from cooking stoves or domestic fire-places shall be economized for heating the said retort, providing suitable dampers so that the waste heat may only act on the retort when desired." From the retort is carried a pipe or pipes into a vessel "to receive any condensed matter, thence direct to the burners." In addition to the foregoing a pipe is provided "for carrying off steam and other incombustible gases given off immediately after charging the retort, and for permitting the escape of any extra pressure or surplus when a supply is no longer desired." "This pipe may be connected to the retort or to the supply pipes, and is led into the chimney or outside the building; but to prevent the internal pressure from becoming dangerous, and the admission of atmospheric air into the retort, where it would form an explosive mixture," a safety valve weighted to open outwards only, is fitted in the said pipe.

[Printed, 4d. No Drawings.]

A.D. 1862, March 3.—N^o 578.

TILLAM, THOMAS.—"An improved method of purifying gas." This consists, in "the combination for that purpose of oxyde of manganese, with lime and with cocoa-nut refuse or ground bark or sawdust, or any known filtering agent used in the purification of gas." "The proportions in which the ingredients are to be combined may be varied, but about equal parts by weight of the oxyde and the lime may be used." In some cases the following proportions are "generally suitable, that is to say, 1 cwt. lime; 1 cwt. sawdust; $\frac{1}{2}$ cwt. of oxyde of manganese," preferring to proceed as follows, first, slack the lime with a minimum of water so as to get it as dry as may be, then mix it with sawdust, the filtering agent recommended, though others may be used, and "next add the oxyde of manganese in a state of powder;" thoroughly mix the whole together and sift the mixture. "The mixture should be kept dry until required for use, and should be damped just before introducing it into the purifier." What is meant by "cocoa-nut refuse is the refuse of the operation of stripping or 'breaking' cocoa-nut to prepare its fibres for textile and other manufacturing uses," using the

granular portion of this refuse separated from the dust. The oxide of manganese may be used with sugar of lead in place of lime in the mixture, but its use is not recommended, nor is it claimed as part of this invention.

[Printed, 4d. No Drawings.]

A.D. 1862, March 6.—N° 606.

HACK, THOMAS, and CARTER, ALFRED EDWIN. — “Improvements in screw cocks.”

The object of this invention is to prevent the leakage to which ordinary screw cocks are liable at the part where the valve spindle passes through the cover. The packing placed there soon wears out. To avoid using it, “we cause the valve spindle to terminate within the valve case with a head suitable to receive a key. A corresponding key is placed immediately over the head, and the stem of this key, which is cylindrical, passes out through a corresponding hole in the cover of the valve case, the stem of the key fitting the hole loosely. Beneath this hole a cylindrical chamber, somewhat larger than the stem of the key, is formed in the cover of the valve case. The lower part of the key is enlarged to fit this hole, and between the top of the enlargement on the key and the top of the cylindrical chamber a ring of brass is placed, which is fitted accurately both to the surfaces above and below it. The fluid within the valve case being in contact with the bottom of the key presses it upwards, and keeps the top of the enlarged portion of the key in close and fluid-tight contact with the top of the chamber in the cover of the valve case, thus the escape of fluid by the passage by which the key passes out is prevented.”

[Printed, 6d. Drawing.]

A.D. 1862, March 10.—N° 650.

KROMSCHROEDER, HENRY HERMAN. — “Improvements in gas meters.” These are said to be the combined arrangement, as follows:—The measuring drum consists of a series of excentric measuring chambers, five preferred, a hollow floating cylinder is within the measuring drum, which has closed ends, “so as to prevent the water in the meter from entering into the interior of the cylinder. The axis of the measuring drum passes through the hollow cylinder and is fastened to the two ends thereof. Between one end of the drum and the end of the

“ hollow cylinder there is a space into which the end of the gas
“ supply pipe enters. The ends of the axis of the measuring
“ drum are supported by a lever frame, within which the measuring
“ drum is received. The axes or necks of the lever frame
“ are received into suitable bearings at the ends of the meter,
“ and the ends of the axis of the measuring drum are so carried
“ by the lever frame as to admit of the axis rising and falling in
“ the same vertical plane. On one end of the axis of the
“ measuring drum is a worm which works or gears with a long
“ pinion on the axis of the counting or registering apparatus of
“ the meter. At one end of the lever frame is fixed a regulator,
“ which consists of an inverted vessel, the lower or open end of
“ which is constantly below the water level in the meter. The
“ upper or closed end of the regulator is provided with a flexible
“ stop or valve, which, when the water falls too low in the meter,
“ comes against and closes the inner end of the outlet pipe of the
“ meter, and prevents the gas passing out of the meter. The
“ inlet or gas supply pipe passes into the meter at its upper part,
“ and descends to the bottom of an overflow vessel or waste
“ water box at the lower part of the meter. The waste water box
“ which is at the front end of the meter, is divided by a partition,
“ so as to retain at all times a sufficient depth of water over the
“ lower end of the gas supply pipe to prevent gas passing into
“ the overflow vessel. The gas supply pipe towards its lower
“ end has two branches, the upper end of one of which enters
“ the regulator, and rises somewhat above the highest water level
“ in the meter. This branch passes from the supply pipe, which
“ is at the front end of the meter; and near the middle of that
“ end in an inclined direction, and enters under the front end of
“ the regulator, and then passes in an inclined direction towards
“ the back end of the regulator, by which arrangement any
“ attempt to obtain gas from the meter without its being measured
“ will be prevented. The upper end of the other branch passes
“ into the spaces in front of the measuring drum and rises to
“ the point of the highest water level of the meter. The water
“ is introduced into the meter by a pipe applied at the front end
“ of the meter, which descends to near the bottom of the meter.
“ The correct position of the drum is regulated by adjusting the
“ weights applied at the opposite end of the lever frame to that
“ where the regulator is affixed.”

[Printed, 10d. Drawing.]

A.D. 1862, March 12.—N^o 664.

NORMANDY, ALPHONSE RENE LE MIRE DE.—“An improved mode of connecting gas and other pipes.” “The pipes to be connected are made plain at their ends,” and “a disc or plate with a hole in the centre of it, the diameter of which should be rather larger than the external diameter of the pipes, is then slipped over the ends of each pipe, and a washer or packing of vulcanized india-rubber, smaller than the pipes to be united, is then slid over each end of the said pipes so as to grip them tightly; or if another suitable material other than vulcanized india-rubber, such as, for example, gasket and tallow, or gasket and red lead, or other similar or analogous substance is used, then the said gasket should be tightly wound round the end of each of the pipes, leaving, however, a portion of each pipe to protrude beyond the said washer’s packing and afterwards over the ends of the pipes, and between the said washers or packing a short length of tube or plain socket made just to fit loosely to the exterior of the pipes is passed. The ends of the pipes to be connected are then butted end to end, so as to meet about midway within the short exterior tube or loose socket, and the plates or discs are drawn towards each other by bolts, the washers being by this means compressed between the plates or discs and the ends of the short tube, and a secure joint is thus made.”

[Printed, 6d. Drawing.]

A.D. 1862, March 13.—N^o 692.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Jean Claude Garnier.*)—“Improvements in apparatus for measuring and regulating the flow and pressure of gas, parts of which are applicable to hydraulic receivers and steam generators.” These are, in reference to this subject, as follows:—A case contains a metal box, the lower part of which is divided into two compartments, one of which is in communication, through a conduit, with a bell, the sides of which dip into water that is held in the box. A conduit also connects the other compartments with the part of the bell that contains gas. The gas inlet pipe communicates with the first-mentioned compartment, the mouth of the conduit in which is wholly or partially closed by a conical valve. The rod

of this valve is connected to the bell, therefore, when the bell rises by the influx of gas, the valve tends, by its upward motion, to close the mouth of the conduit. A large dial, the wheelwork of which is mechanically connected to the rod of the conical valve, measures the gas; two small dials, whose wheelworks are respectively connected to the rods or bells of suitably placed manometers, show the pressure in the entrance and exit pipes respectively. A closed reservoir of water, having an air pipe and water pipe, maintains the level of the water in the meter and manometers. A bell-ringing apparatus, in mechanical connection with a white and red indicating disc, and with the rod of the conical valve, is actuated on the extinction of the last gas burner. The escape of gas is indicated by the large dial. In the Provisional Specification, the manometers have bells instead of floats, and the arrangement of the bell-ringing apparatus is different from that set forth in the Final Specification, the former showing two "travellers," the latter one "traveller."

[Printed, 1s. 2d. Drawings.]

A.D. 1862, March 13.—N° 699.

SCHOMBURG, RUDOLPH, and BALDAMUS, ADOLPH.—(*Provisional protection only.*)—"Improvements in purifying illuminating gas." These are, separating from the gas the sulphide of carbon which it contains and which produces sulphurous acid, which is destructive to furniture, &c., by causing "the gas to come in contact with hydrocarbon or other oil, or a solution of fat, soap, or rosin; these substances have the property of absorbing the sulphide of carbon. The purification may be effected either at the gas works or by each consumer." It is preferred "to employ for the purpose a disc of perforated metal, kept constantly revolving; the lower part of this disc dips into the oil, or other liquid, and brings up as it revolves a film of this material, portions of the film closing the perforations in the disc. The gas is caused to come in contact with the disc and pass through the perforations therein, so that the liquid may be able to act on every portion of the gas." When the purification is effected separately by each consumer the purifying apparatus is connected with the gas meter and the perforated disc is driven thereby. "When the liquid becomes saturated with sulphide of carbon the latter may be separated and obtained by

“ a process of distillation, leaving the oil or liquid in a state to be again used.”

[Printed, 4d. No Drawings.]

A.D. 1862, March 14.—N° 705.

SANBORN, GEORGE HENRY.—(*A communication from Jeremiah Henry Norton.*)—(*Provisional protection only.*)—“Improvements in gas regulators.” These are as follows :—“The shell or body of the regulator is divided into two compartments, one above the other, the gas from the main enters the lower compartment near one of its ends ; near the other end of this compartment a short tube projects down from the partition which divides the compartments. Both ends of this tube are open, so that the gas may pass from the lower into the upper compartment. Below the end of this tube is a cup containing quicksilver, into which the end of the tube dips ; in the end of the tube are notches or openings, which are not at all times covered with the quicksilver ; these notches may be of different depths, so that if the cup containing the quicksilver is raised the quicksilver may in succession close the passage through the notches, one notch is, however, made sufficiently long that it cannot at any time be covered with the quicksilver, and thus the flow of gas into the upper compartment can never at any time be entirely cut off. The top of the upper compartment is covered by a lid, and around the interior sides of this compartment, near its top, a trough is formed, above which is a cap or cover which has formed all round its edges a descending flange, which enters the trough ; this trough is filled with mercury, so that the cover may rise and fall without any gas being permitted to escape from the upper compartment, the flange of the cap being always covered with the mercury. The cup of quicksilver above-mentioned is suspended from this cover by a rod, which passes down through the centre of the tube, below which the cup of quicksilver is situated, this rod is near one end of the cover, and the cover at its other end turns on pins or pivots carried by the body or shell of the regulator.”

[Printed, 4d. No Drawings.]

A.D. 1862, March 17.—N° 731.

MONGRUEL, LOUIS PIERRE.—“An improved cold vapor generator, which may also be used in the carburation of illumi-

"nating gas." This consists of a metal or other suitable vessel, cylindrical or otherwise, and of any suitable dimensions, divided so as to form two chambers, one above the other; the upper one is a reservoir of volatile liquid filled from above, which feeds continuously and regularly (through a tube with stop-cock, and "floating valve) a thin layer or sheet of liquid spread on the "bottom of the lower compartment," provided with "a number of vertical wicks passing through the meshes or rings of "two superposed metal discs, and steeped at bottom in the "before-mentioned sheet of liquid which rises along them by "capillary attraction." The feeding of the sheet of liquid is through a descending tube above-mentioned, and if of moderate diameter will of itself maintain the sheet of liquid in the basin at one constant level, but if too small to allow the air or gas "to rise within it by the side of the liquid passing downwards a "second tube will be necessary to cause air or gas to rise from "the lower chamber and assist the flow of the liquid required to "replace that which has been used by evaporation." This tube or these tubes may be used interiorly or exteriorly. The upper chamber is hermetically closed. Two conduits are added to the apparatus "exteriorly or interiorly," for the introduction of the current of gas into the basin in the middle of the vapors and its subsequent exit to the establishment to be lit, and so made that the gas or other pipes may be easily fitted to them. The gas to be charged with the hydrocarbon "is taken at will from the meter, "introduced from the right or left into the vapor chamber, amidst "the assemblage of capillary wicks, which it is forced to traverse "and issues in front after having partially licked and dried the "wicks."

[Printed, 10d. Drawing.]

A.D. 1862, March 17.—N^o 744.

MYERS, THOMAS.—"Improvements in meters for measuring "water, gas, or other fluids." These are, "the general arrangement and construction of meters." "The arrangement of "waterways acted upon, and in combination with a diaphragm or "side valve," also, "of the rollers and the mode of working the "same on the diaphragm, or with the side valve in connection "with levers, connecting rod, and spring plungers, which are "acted upon by the piston rod;" and likewise "the slide valve "having apertures or perforations through the same for the pas-

“sage of water, gas, or other fluid, and the arrangement of working the same,” as follows:—There is a measuring cylinder furnished with valves, valve boxes, and ducts, and fitted “with a piston having a piston rod protruding beyond the top of the cylinder with collars thereon, between which work the end of a lever supported by standards, with a roller at one end to prevent friction, the other end being forked to guide and work a slide valve made of brass or other suitable material, or rollers which pass upon a diaphragm valve made of india-rubber or other elastic or pliable material, such slide or diaphragm valve covers several ducts.” The “slide valve or the rollers acting on the diaphragm are so arranged as to press upon and close one or more of the said ducts at one time. Some of the ducts (two by preference) lead some (one by preference) to the upper and some (one by preference) to the lower part of the cylinder, and hence upon water, gas, or other fluid being admitted by the supply pipe, it will, according to the position of the piston and the attached piston rod, cause the opening of some of the ducts and allow the water, gas, or other fluid to enter either above or below the piston, and thus keep it in motion. Instead of the above arrangements using “a measuring cylinder in which a piston works, and attached thereto and communicating therewith a valve box with valve ways opening to the upper and lower part of the cylinder. In the valve box is a slide valve, which is made of a cylindrical form, but hollow at its upper and lower portions, and having apertures or perforations through such hollow portions, so as to allow of communication with the said valve ways through the supply pipe connected with the said valve box.” “The fluid is admitted into the same by reason that the said supply pipe branches off to the top and bottom of the valve box and consequently, according to the position of the piston in the cylinder, the fluid will pass above or below the said piston, as the case may be. The valve is moved to and fro by means of rollers acting on a lever having its fulcrum on the box cover, the rollers being attached to the piston.”

[Printed, 10d. Drawing.]

A.D. 1862, March 20.—N^o 778.

FIELD, EDWARD.—“Improvements in apparatus for regulating the flow of gaseous and other fluids.” These are, “the use or

“ employment in regulating the flow of fluids of a piston, valve,
“ or other equivalent part, through or around which a portion of
“ the fluid passes, and which is so connected with another piston,
“ valve, or other equivalent part as to open or close the inlet
“ opening as required.” “ The principle of its action consists in
“ causing the fluid whose velocity is to be regulated to pass into
“ a chamber from which its exit must take place through or
“ around a moveable piston, diaphragm, plate, or leaf, connected
“ or formed with or attached to another piston, diaphragm, plate,
“ or leaf in such manner as that any variation of the velocity of
“ the passing fluid, by acting upon one or other of the pistons,
“ diaphragms, plates, or leaves shall cause the other to propor-
“ tionately open or close the opening by which the fluid passes
“ through the regulator. It will be observed that the action of
“ this regulator differs from that of others in being dependent
“ upon the velocity (instead of upon the pressure) of the passing
“ fluid.”

[Printed, 10d. Drawing.]

A.D. 1862, March 21.—N° 785.

NEWALL, JAMES.—“ Improvements in supplying gas to rail-
“ way carriages, stations, steam-boats and other vessels, omni-
“ busses or other carriages, at any required pressure, and in
“ apparatus connected therewith.” These are, first, compressing
“ the gas in the stationary holders with water or other suitable
“ liquid,” so as “ to supply a train with the necessary amount of
“ gas in an incredibly short space of time.”

Second, “ the reserve boxes to prevent the lights being ex-
“ tinguished by any reaction of the flexible holder,” and “ the
“ peculiarly formed flanges by which the lamps are supported
“ and the attendants enabled to remove them from the inside of
“ the carriages.”

Third, “ the general arrangement of apparatus for lighting
“ railway carriages,” &c. &c.

To a vessel or cylinder is attached “ a water gauge, a gas feed
“ pipe for supplying the same, another pipe for supplying the
“ compartments or places, a water gauge, a water exit pipe, a
“ supply pipe for conveying the water into the said vessel to
“ compress the gas.” The vessel or cylinder is first filled “ with
“ water from high-pressure water pipes to drive out the atmos-

" sphere or any impure air," the water exit valve or tap is then opened to let the water out and then admit gas into the vessel or cylinder to supply the partial vacuum created by the exit of the water. When the water is nearly all run out and the vessel or cylinder is full of gas both the water exit valve or tap and also the gas valve or tap are closed. To compress the gas water is admitted at any necessary pressure, and when the gas is so compressed it is passed into a holder fixed in any convenient part of a carriage, compartment, &c., required and then apply suitable valves or apparatus to reduce the gas from high pressure to any ordinary burning pressure that may be required either for heating or lighting purposes. For warming or heating railway carriages, &c. a jet or burner is fixed inside "a small cylinder or other shaped vessel in any convenient part of the carriage, compartment, cabin, or other required place," with a pipe to give the necessary ventilation. The portable flexible gas holder placed in any convenient place, is weighted on the top or lid, or made of the required weight to give the necessary burning pressure, and bands of iron or other suitable metal are placed at certain distances from each other round this flexible holder "to make it fall uniformly on all sides as the gas is consumed." Two small reserve boxes are "placed between the flexible holder and the lights," which "contain a supply of gas to prevent the lights being extinguished by any reaction of the flexible holder." There are "flexible pipes with union or other suitable couplings to attach and detach the carriages." The pipes are of sufficient length to curve downwards between the carriages to allow for the expansion or contraction of the buffers." The lamps are shown of a globular and triangular shape, with "flanges for supporting the same, and allowing them to be taken out and replaced from the inside of the carriage instead of the top or outside."

[Printed, 1s. 4d. Drawings.]

A.D. 1862, March 24.—N^o 811.

TURNER, SAMUEL ELLISON.—(*Provisional protection only.*)—

" An improved apparatus for burning a mixture of inflammable gas and air."

This relates to an apparatus for effecting the above "in present use, wherein the inflammable gas escapes from a jet placed

“ inside a cylinder, open at the bottom and covered at the top,
“ with a diaphragm of wire gauze or finely perforated plate, so
“ that atmospheric air enters the bottom of the cylinder, and
“ mixing with the inflammable gas issuing from the jet assists
“ the combustion of the same, which takes place on the top of
“ the perforated diaphragm. Such burners have been further
“ provided with a cylinder of wire gauze or perforated metal
“ placed on top of the before-mentioned cylinder so as to sur-
“ round the flame of mixed gas and air, by which arrangement a
“ somewhat more complete combustion of the same was effected,”
and this invention is for rendering this combustion “ considerably
“ more perfect, and consists in introducing one or more metal
“ tubes into the before-mentioned bottom cylinder, wherein the
“ mixture of the gas and air takes place, which tube or tubes
“ is or are open at bottom and pass up through the before-
“ mentioned gauze or perforated diaphragm and into the chamber
“ in which the combustion takes place, where it is or they are
“ finely perforated, and is or are, by preference, closed at the top,
“ or a tube or tubes of wire gauze may be employed instead of
“ the perforated portion of such tube or tubes.” In preference
the top of this apparatus, which is otherwise quite open, is pro-
vided “ with a cap or covering of wire gauze or perforated plate,”
which on “ becoming heated to a red heat by the combustion
“ decomposes the deleterious products of the same as they pass
“ through it.”

[Printed, 4d. No Drawings.]

A.D. 1862, March 26.—N^o 838.

TAYLOR, JOHN, and MINCHIN, CHARLES HENRY.—(*Pro-
visional protection only*).—“ A suspender or improved gallery for
“ supporting the shades of gas or other lights.” This consists
as follows, “ instead of the three-armed gallery as hitherto used,”
a fixing is made bending a little upwards, which is “ screwed or
“ otherwise fixed on the gas fitting, so that the flame of gas
“ issuing from the said fixing will ascend as nearly as possible
“ vertically, and thus avoid the danger of breaking the shade.”
To this fixing is attached “ in any convenient manner an elastic
“ spring or clip to support the globe or shade, which will hold or
“ support it without the aid of the ordinary thumbscrews and
“ hooks as heretofore adopted. It is evident that this method

" of supporting the globe or shade will dispense with the
" shadow caused by the ordinary gallery, and be much more
" economical."

[Printed, 4d. No Drawings.]

A.D. 1862, March 28.—N° 869.

SMITH, EDMUND.—"Improvements in wet gas meters." These are as follows:—The inlet and outlet passages of the meter are attached to a chamber in front of the wheel case, and another chamber below this serves as a water reservoir and to receive the gas to be measured. When water is supplied to the meter through a side box it enters the front box and wheel case, then overflows down a pipe which communicates with the lower chamber, and fills the said lower chamber up to the height of a plug. The gas enters the meter by the inlet passages, passes by a float valve and pipe into the lower chamber and ascends "into
" the chambers of the wheel to give rotary motion to it." The axis of the measuring wheel gives motion by means of screw and screw wheel gear, to the ordinary counting or "index" apparatus in an upper box. The gas having passed through the measuring wheel, escapes into the case and passes out by the outlet pipe, the lower edge of which is placed just above the water line. Any increase of water in the meter will overflow into the lower reservoir and close the gas passages that comes into the said reservoir. Diminution of water in the meter will sink the float valve and close the inlet passage; a similar effect will take place upon the tilting of the meter backwards. If the meter is tilted forward it will close the outlet passage by bringing the water up to its mouth. When water is drawn from the emptying plug, tilting the meter forward will open the float valve, but a pendulum valve will then close the entrance of the gas to the measuring wheel. The objects of this invention, accuracy of registry, and prevention of fraud, are thus said to be attained.

[Printed, 1s. Drawings.]

A.D. 1862, April 2.—N° 927.

MALAM, WILLIAM.—(*Provisional protection only.*)—"An improvement in the manufacture of gas, and improved apparatus
" to be employed in such manufacture." This is in place of
charging the retort at once with coal by opening the retort and

filling it, the retort is charged "without opening it, supplying
 " it with coal or material in small quantities at a time gradually,
 " and if desired continuously, and at a rate that may be regulated as required." The retort is generally fed "at or about
 " the centre or from end to end." In the apparatus preferred
 " a hopper is fitted to the retort with which it communicates by
 " a passage leading thereto, and a feed or compartment which is
 " placed between the hopper and retort. This wheel consists of
 " a number of compartments or cells, set round an axis; the
 " section of the mouth of each cell is larger than the section of
 " the feed opening or bottom opening of the hopper, so that as
 " the wheel revolves each cell fills with coal which it carries
 " down with it and discharges into the retort. Or instead of the
 " wheel one or more crushing or fluted rollers may be used which
 " reduce or pulverize the coal and discharge it into the retort.
 " When two such rollers are used, they may be in gear, or
 " slide plates may be used instead of wheels or rollers. The coal
 " may be deflected or guided by guide plates which may be
 " adjusted to extend or contract the feed opening. The velocity
 " of the wheels, rollers, or plates may be regulated as desired." The bottoms of the retorts are sometimes formed convex, of a hemispherical form or nearly so, or they may be conical, or other curves or convexities may be adopted. The retorts are sometimes set "in the furnace in fire-clay or other refractory cases made in
 " pieces, preferring to form such casing of a series of arches
 " bevelled at their edges where they meet, each arch consisting of
 " separate halves fitting together at top by step joint, step fitting,
 " or otherwise."

[Printed, 4d. No Drawings.]

A.D. 1862, April 4.—N^o 969.

NOCK, JOHN, and PRICE, WILLIAM KIRBY.—(*Provisional protection only.*)—"An improvement or improvements in gas
 " cooking ranges." This consists "in lining the inside of such
 " ranges with glazed tiles or slabs placed a slight distance
 " within the outside casing. The effect of this is that a much
 " higher temperature can be obtained with a smaller consumption of gas, the tiles reflecting the heat inwards, whilst the
 " space between the tiles and the outer casing keeps the latter
 " cool."

[Printed, 4d. No Drawings.]

A.D. 1862, April 9.—N^o 1008.

FARRON, SQUIRE.—“Improvements in machinery or apparatus for regulating the supply of steam from the boiler to the cylinder or pipes of steam engines, which improvements are also applicable to gases or fluids,” “or for any other purpose where a steam, gas, or fluid tap is or may be used.”

This invention consists “in the employment of a small cylinder closed at the bottom, and having in its interior a piston exposed at the top to the pressure of the atmosphere, and also to the action of a lever and weight. The steam, gas, or fluid is admitted to the small cylinder through two internal apertures, and from thence through a large aperture to the exit pipe of the small cylinder. . . . At the front of the larger aperture of the piston there is a thoroughfare leading to the under side of the piston, so that the steam, gas, or fluid may raise it according to their pressure and the resistance of the lever and weight, so that when the apertures of the small cylinder are fully open to the aperture of the piston, the supply of steam, gas, or fluid is at its maximum; but as the piston rises from its under pressure the apertures of supply are being closed exactly in proportion to the weight upon it, and thereby regulate the supply in a self-acting manner.”

[Printed, 1s. 2d. Drawings.]

A.D. 1862, April 10.—N^o 1021.

FRYER, DANIEL, and WILLIAMS, WILLIAM JAMES.—*(Provisional protection only.)*—“Improvements in the method of and apparatus for letting on and cutting off the supply of gas to groups or districts of street and other lamps from a central point or depôt.” These are “applying to the ordinary branch gas tube which supplies each lamp, a flexible air-tight junction of india-rubber or such like material, that is to say, the gas tube may be severed, and a piece removed anywhere near the lamp post, and the severed ends joined with a piece of flexible tube having air-tight joints. On each side of the tube may be placed two small plates to act as nippers, so that if they be compressed by any force they will nip the flexible tube and close the passage;” this flexible portion is enclosed in “an air-tight flexible chamber formed of materials capable of allow-

“ing it to collapse and expand without fracture when the air is
“withdrawn or forced into it. In order to exhaust or force air
to these flexible air-tight chambers, the following arrangement is
adopted:—“Starting from each central point or depôt, an air-
“tight pipe passes to each group or district of lamps, and from
“this tube an air-tight junction tube proceeds to the flexible
“chamber attached to the supply pipe of each lamp, and termi-
“nates in an open end in the said air-tight chamber; the ends
“of all the main or district pipes are collected or terminate in an
“air-tight tank or chamber, to which is attached a large air
“pump or air-exhausting machine. By means of the pump or
“machine it will be seen that the air may be withdrawn or forced
“into the flexible chamber at each lamp, and the gas either cut
“off or let on at pleasure, and almost instantaneously.” It is
preferred to light the above arrangement by means of an electric
spark, passed along a wire to each lamp, but it is stated that this
mode of lighting has been previously applied and is not claimed
except when used in connexion with the above mode of letting on
and cutting off the supply of gas to the lamps.

[Printed, 4d. No Drawings.]

A.D. 1862, April 24.—N^o 1191.

ENDEAN, JOHN.—“Improvements in cocks, taps, and valves.”
These are “a duct or ducts is or are formed with a cock, tap, or
“valve shank as it is termed, having a chamber or valve box
“provided with a solid enlargement of the said duct or ducts of
“conical or conoidal form with the requisite apertures therein,
“and upon the conical or conoidal part is fitted a hollow cone
“or conoid corresponding thereto, provided also with apertures
“to correspond with the apertures communicating with the ducts
“and ways adopted, so that the steam, gas, water, or fluid will
“enter the valve box or chamber, pass over or against the said
“hollow cone or conoid and out at the outlet or outlets. This
“hollow cone or conoid being provided with a stem, spindle, or
“handle, passing through the chamber or valve box aforesaid
“whereby the hollow cone or conoid may be turned so as to
“bring the apertures therein upon, to, or away from the aper-
“tures in the aforesaid enlargement of the duct or ducts, and
“thus open and shut the same as desired.” The apertures are
arranged so that “the inlet shall never be closed, and hence the

"hollow cone or conoid shall always be kept held to its seat with an equal pressure on its entire surface." "The water, steam, gas, or fluid will be allowed at all times freely to come in by the inlet aperture, and thus press the hollow cone tightly upon or against the enlargement aforesaid, but if this pressure should in any case be deemed insufficient a coiled spring can be applied round the spindle."

[Printed, &c. Drawing.]

A.D. 1862, April 24.—N° 1196.

WINSBORROW, JOHN.—"Improvements in wet gas meters." These are to facilitate and render more uniform the supply of gas by wet gas meters. For this purpose "the inlet valve in place of being applied direct to the float is attached to it by a leverage in such manner that when the float rises and falls a short distance, the distance of motion of the valve is increased in proportion to the difference in the length of leverage employed." One end of the lever is supported so as to turn in bearings, whilst its other end is by a pin joint connected to the stem of the valve, and the float is connected to the lever by a pin joint. "The float moves in a chamber sealed above the water line from the inlet valve so as to have gaseous communication only with the measured gas chamber," whilst its upper end has a stem, by which it is guided in its motion.

[Printed, &c. Drawing.]

A.D. 1862, April 26.—N° 1234.

HART, HERBERT WILLIAM.—"Improvements in the manufacture of reflectors and shades for gas and other lights." These are "the application of a metallic surface to paper or cardboard" for the above purposes. These are generally prepared of a truncated conical form, and the metal is applied to the surface "either in the form of thin tin or other reflecting metal foil which may have been previously prepared and applied on thin paper, as well understood in preparing metal foil papers." "Instead of forming the shade first and then applying the metal foil or foil paper surface, it may be applied in the flat on paper or cardboard and subsequently cut and converted into the form of shade desired." This paper foil reflector may also be applied to the reflection of light generally, adopting its form to the purpose desired. "For some purposes the cone of the shade

" may be much flatter than in billiard table lights, or even entirely flat, in such shades it is preferred to make" the reflecting surface of a series of facets, which can be effected by embossing or pressing as well understood as applied to paper. This facet is applied for the reflection of daylight. " When used for daylight reflectors the paper body and metallic surface must be carefully protected from the weather."

[Printed, 4d. No Drawings.]

A.D. 1862, April 30.—N^o 1284.

WILLIS, HENRY. — "Improvements in valves for the supply and discharge of gaseous bodies." These are, applying "the principle of buoyancy for keeping the valve to its seat," and valves are described as "applied to the supply of wind from the wind chest of an organ to the grooves or channels in connection with the pipes." When adapting the buoyant valve to gas regulators it is fitted up by preference upon "a modification of a Kidder's gas regulator." The gas regulator consists mainly of two castings, the lower one of which, besides containing an inlet and outlet passage for the gas, is fitted with three annular channels for receiving mercury or other suitable fluid; the upper one is a cylindrical casting, which serves as a guide for the stem of the regulator, and also forms a seat for a buoyant valve consisting of an open cylinder which is connected to the stem of a ball or inverted cup, so that both the ball and valve rise and fall together. The bell is weighted so as to regulate the flow of gas through the apparatus (whatever the pressure at which it is supplied) according to the well-known principle of action of "the Kidder gas regulator." The cylinder above referred to is placed in the second or middle one of the annular channels, the mercury in which seals the joint. The bell or inverted cup dips into the mercury in the exterior or outer annular channel, and the valve dips into the mercury in the third or inner annular channel. When the gas is turned on from the main, but none is being burned, the upward pressure of gas upon the bell will close the valve. "When, however, a supply of gas is required, and a vent is opened for the gas, the bell will descend and open the valve," "which, will, however, throttle the central opening in the cylinder" "to the required extent to ensure an equable pressure at the burners."

[Printed, 10d. Drawing.]

A.D. 1862, May 2.—N° 1304.

NEWTON, ALFRED VINCENT.—(*A communication from Robert Cornelius.*)—"Improved electrical apparatus applicable to the lighting of gas." The construction of the apparatus is as follows "for obtaining electric sparks and applying the same to the ignition of gas and like inflammable matters." "The gas burner to be lighted is fitted with an electric conductor, consisting of a pointed wire which is carried by a bracket of vulcanite or hard rubber or other good non-conductor, and bent over the top of the burner. A chain leading from this wire is carried to some accessible point, and being touched by the electric apparatus will convey the electricity upwards, and cause the ignition of gas issuing from the burner." This apparatus admits of various forms and arrangement, "but it consists simply of conducting and non-conducting surfaces, between which a highly electric substance, such as silk or lambs' skin, is interposed; a slight friction therefore set up will generate electricity sufficient to give off a spark." "One form of apparatus consists of a disc of metal, which is covered with lambs' skin, and the other half with silk, and fitted with a non-conducting handle. One half of the lamb skin is overlaid with silk. The apparatus is completed by a disc of metal fitted with a disc of hard rubber, and fitted with a metal handle, the attaching metal pin of which passes through the hard rubber disc. The covered and uncovered discs being slightly rubbed together, sufficient electricity will be generated to give off a spark when brought to the gas burner; or the apparatus may be made by substituting a metal bell or cylinder, coated inside with lambs' skin for the metal disc, and making the non-conducting surface of corresponding form to receive it. Within the hard rubber or other non-conductor, which is made hollow, is placed a roll of tinfoil, which is in contact therewith, and with a metal stand or pedestal that supports the same. The lifting off of the bell or cylindrical-shaped cover will suffice to generate the electricity." "In order to give the apparatus the property of a Leyden jar a cylinder, with a closed bottom and coated inside with a non-conducting surface, is employed. Within this cylinder fits a closed metal cylinder, covered on its periphery and lower end with lambs' skin. By applying to this apparatus a non-

“conducting handle it may be used as a portable gas lighter; but when placed on a suitable bracket and connected electrically with the pointed wire of the gas burner, it will be ready for instant action.” A further modification consists “in forming the apparatus of two metal tubes, closed at their outer ends and connected together at their inner ends by a collar of vulcanite. The tubes are lined with lambs’ skin or its equivalent, and enclosed within the tubes is a metal rod coated with vulcanite. The depression or elevation of one end of the tube will cause the metal rod to slide downwards by its own gravity, and thus electricity will be generated. The act, therefore, of rising the compound tube to the gas burner will suffice to create a spark for lighting the gas.”

[Printed, 1s. 4d. Drawings.]

A.D. 1862, May 5.—N° 1332.

BINKS, CHRISTOPHER.—(*Provisional protection only*).—“Improved methods of obtaining hydrogen gas and certain gaseous compounds of hydrogen and of carbon.” These are, applying “to carbon or carbonaceous materials, whilst kept at ordinary temperatures, steam previously so strongly heated or superheated as to be decomposed on contact with the carbon, and as contradistinguished from the usual method resorted to for decomposing water through the agency of carbon, of strongly heating the carbon, and applying to it steam of ordinary temperatures.” This method is varied or modified, “when desirable, by obtaining the requisite decomposing or combining temperatures by heating previously to contact both the carbon or carbonaceous materials and the steam,” the object, it is said, being “to facilitate and economise the production of hydrogen gas, certain gaseous hydrocarbons, and carbonic oxide for application to various useful purposes.”

[Printed, 4d. No Drawings.]

A.D. 1862, May 7.—N° 1358.

BOURDON, EUGÈNE.—“Improvements in the construction of blowing fans, which improvements are also applicable to centrifugal pumps for raising water and other liquids or gases or for exhausting the same.” These are, in reference to this subject, in “apparatus for exhausting illuminating gas from the

“hydraulic mains of gas works, and to propel the same through
“the condensers and purifiers into the gas holder” by means of
a spherical casing placed in a horizontal position, in the under
side of which is a central opening, over which is fixed “a tube in
“an air-tight manner, which tube passes downwards and dips
“with its extremity into a vessel containing water, oil, or any
“other suitable fluid, forming an hydraulic joint round the
opening of a pipe which passes up through this vessel into the
before-mentioned tube, through which pipe the gas passes from
the hydraulic main. By this arrangement, if the spheroidal
casing or drum be caused to revolve rapidly the centrifugal force
will draw the gas up into it through the before-mentioned tube
attached to the drum, and it will be conducted thence by an
“internal stationary tube,” which passes down “through the
“stationary pipe conducting the gas into the apparatus.” In
some cases, instead of one or more stationary curved tubes for
conducting the gases, &c. from the revolving drum, introducing
“into the casing or drum a stationary hollow disc, open at its
“circumference and having a number of curved partitions so
“formed that between each two of them” the gas, &c. “as it
“is thrown in is conducted to the centre, where all the channels
“open into one conducting tube which passes out at the central
“opening of the revolving casing or drum.” Also sometimes
dividing and subdividing the interior of the casing or drum into
compartments.

[Printed, 1s. Drawing.]

A.D. 1862, May 10.—N^o 1404.

MOORE, ROBERT. — “Improved apparatus for indicating the
“presence, position, or accumulation of liquids, gases, or
“vapours, and apparatus for preventing danger or damage
“consequent thereon.” This consists, in reference to this
subject, first, in using an instrument “supplementary or inde-
“pendent for the escape of gas from tubes or other conduits
“consisting of a rotating disc or series of arms or other revolving
“appliance set on a spindle or axis attached to the gas meter or
“other contrivance capable of conveying to the disc or arms the
“motion resulting from variations in the current of gas. This
“disc or revolving appliance is connected with the transmitting
“medium, and its periphery is contrived to present partial

" interruptions to the point of connexion, so that the connecting balance spring, rod, lever, or other contrivance being placed at one of the spaces of interruption will convey no signal until an escape takes place, which will be indicated by the meter or other gauge, and thereupon the disc will revolve and complete the connexion, which will convey the appropriate signal; and if the escape continue an arm attached to the disc or axis will bear on a lever or trigger contrived to close a valve, thereby shutting off the gas."

Second, using an apparatus in combination with the following apparatus:—Namely, a box or case with a fluid in which is a float or regulating body, which is depressed by the action of the atmosphere, and by contact with an arm gives a signal; or using a chamber with perforations or openings similar in principle to a Davy lamp, in which two electrodes are placed so as to give a permanent, periodical, or intermittent incandescence." "When the former indicates an escape of gas the transmitting medium acts on an electro-magnet or other means of disengagement, which may be contrived to hold a lever weighted or any contrivance otherwise adapted to the purpose, and operating by detent, stop, trigger, or other contrivance set on a valve or trap in such a position as to leave the passage of the gas free, whereby the valve or trap will be closed by the lever or other means used, and the supply of gas shut off, with or without a signal, until the escape is remedied, or the instrument restored to its normal state."

[Printed, 10d. Drawing.]

A.D. 1862, May 10.—N^o 1414.

SAMBIDGE, HENRY WILLIAM.—"Improvements in sliding chandeliers, gasaliers, and other pendent lamps." These are, the employment of a vulcanized india-rubber or spring tube with the slides of pendent lamps," by which means the use of water is dispensed with as follows:—"The inner tube which in gasaliers conveys the gas to the body of the lamp" is removed altogether, and in place thereof is substituted "a tube of vulcanized india-rubber containing a spiral spring, if requisite. The upper end of this rubber tube is secured to a nozzle inside the cap of the usual ball joint or to the top connection or neck, which may be used in place of the ball joint. The lower end of

" the tube is connected under the pommel of the outside down rod by a similar nozzle or flanged collar. In case of the breakage of the balance chains the rubber tube prevents the lamp from running down, and if it be applied to a gasalier there is no escape of gas."

[Printed, *sd.* Drawing.]

A.D. 1862, May 15.—N° 1475.

BAGGS, ISHAM, and SIMPSON, WILLIAM.—"Improvements in treating straw, Spanish grass, and other vegetable fibres, in preparing a bleaching agent for vegetable fibres, and in recovering and treating an alkali resulting from the treatment of the said fibres, and in apparatuses employed therein." These are, in reference to this subject, as follows:—To obtain the products above-named, the vegetable fibres also named above are first treated with hydrofluoric gas, then boiled in a solution of caustic alkali, and in place of wasting the alkali in this solution, the solution is caused "to trickle in showers through roses or perforated pipes upon heated metal tubes," in preference placed horizontally. The tubes are united, and steam, air, or water is the heating medium passed through them. The heat evaporates the solution, and the solid deposit on the pipes is collected and distilled in retorts, and "the gas evolved is collected and stored, and is applicable for illuminating purposes." The residue "in the retorts is caustic alkali." "Instead of the liquor being evaporated upon tubes, heated cellular plates or slabs may be employed." The remainder of the Specification has reference "to the manufacture of chlorine and chloride of lime.

[Printed, *4d.* No Drawings.]

A.D. 1862, May 17.—N° 1496.

BINKS, CHRISTOPHER.—(*Provisional protection only.*)—"Improved methods of obtaining oxygen and chlorine gases." These are, in reference to this subject, first, bringing into contact with water or steam strongly heated chlorine, oxygen gas is liberated and hydrochloric acid is formed. "Substances capable of absorbing or combining with the hydrochloric acid formed," are added.

Second. Applying heated dry chlorine to the manganese or other oxides at ordinary temperatures or otherwise; a chloride of

the metal is formed and the previously combined oxygen is liberated in the form of gas. The chloride of manganese may be applied to useful purposes or treated for its recovery as described in No. 1240, A.D. 1860.

[Printed, 4d. No Drawings.]

A.D. 1862, May 26.—N^o 1564.

LIVESEY, GEORGE THOMAS.—(*Provisional protection only.*)—"Improvements in purifying illuminating gas, and in treating "the products obtained in the various processes of purification." These are, in reference to this subject, purifying coal gas "from "the ammonia and sulphuretted hydrogen contained therein by "means of sulphurous acid." In preference, causing "a solution "of sulphurous acid to pass in a downward direction through an "ordinary 'scrubber' filled with coke or other suitable material "through which the impure gas is passing in an upward direction." The gas is then passed up "through a second scrubber, which is "supplied only with water at the top." If any sulphurous acid is with the gas after it leaves the second scrubber, the gas is passed "through a third scrubber down which water is passed containing a little pure ammonia or some of the ammoniacal liquor "from the condensers," and, if requisite, the gas is passed through a fourth scrubber with water only "to remove any traces "of ammonia." A greater or less number of scrubbers are employed "according to the nature of the gas." "In some cases "instead of employing the last two above-mentioned scrubbers" "the gas, after it leaves the second scrubber," is passed "through "the ordinary lime purifiers to remove the remaining sulphurous acid." In some cases the ammonia is first removed "by water "or other known means," and then the above-described process applied "for removing the sulphuretted hydrogen alone."

The remainder of the Specification relates to converting the products resulting from the above mode of purifying gas "into "useful or marketable substances."

[Printed, 4d. No Drawings.]

A.D. 1862, May 26.—N^o 1580.

SPARROW, THOMAS DUTTON TEMPLER.—(*Provisional protection only.*)—"An arrangement or arrangements for shading street "lights, in order to protect or shade the eyes of riders and foot

"passengers from the dazzling effects of the flames of such lights." This consists in attaching to the street lights "metal or other shades, either whitewashed on the side nearest the flame or fitted with reflecting surfaces, the shades and reflecting surfaces being of such form and placed at such angle as to render the flame invisible at the distance of one lamp-post from the next," and making such shades either circular (as for lamps or lights at corner turnings) or "portions of square shades containing one two, three, or four sides, according to the effect desired at each particular spot."

[Printed, 4d. No Drawings.]

A.D. 1862, May 29.—N° 1617.

ABEL, CHARLES DENTON. — (*A communication from Ignaz Heger.*)—"Improvements in apparatus for raising, propelling, or exhausting air, water, or other fluids or gases." These are, first, "forming the rotating vanes or blades of such apparatus of only such a radial depth inward from the circumference of the casing as to constitute an annular fan, blower, or propellor acting upon the air, water, or other gas or fluid which is conducted to the same" as afterwards described. The diameter of the casing and face is enlarged from that of the conducting tubes. The blades or vanes are by preference attached to the external circumference of a drum fixed on a spindle carrying a pulley to which rotary motion is imparted, but they may be also fixed to the internal circumference of a loose ring forming part of the casing to which rotary motion is given from the exterior in any suitable manner.

Second, "imparting a peculiar form to the vanes or blades of the fan or propeller; these are placed in an oblique position to the axis of rotation, but instead of being formed as usual entirely as an ordinary screw blade, the ends only of the blades or vanes are so formed," the outlet side having a greater pitch than the inlet side and the middle "with a curvature which is concave in the direction in which the air, water, or other gas or fluid is propelled, and the surface of which is generated by a straight radial line moving in a curved oblique direction on the surface of the drum."

Third, "fixing guide vanes either both on the inlet and the outlet sides of the rotating fan, blower, or propeller, or only on

“ the inlet or the outlet side. The guide vanes on the inlet side
 “ are by preference so formed that their direction at that part
 “ where the air, water, or other gas or fluid enters is radial, and
 “ more or less parallel with the axis of the tube, whilst they are
 “ curved in the middle in a direction contrary to that of the motion
 “ of the fan or propeller, and terminate in a straight radial sur-
 “ face having the same direction as the curved part.” The guide
 vanes on the outlet side are, “ by preference, formed with a wind-
 “ ing surface, generated by a radial line on an ordinary screw
 “ thread running in the direction of the rotating fan or propeller
 “ at that part where they receive the air, water, or other gas or
 “ fluid from the same, and are then curved round so as to be
 “ radial and more or less parallel with the direction of the outlet
 “ tube at their other extremity.”

Fourth, “ in conducting the air, water, or other gas or fluid
 “ from the inlet tube to the increased diameter of the annular fan
 “ blower, or propeller, by a conical guiding surface or ‘ogival’
 “ projecting from immediately below the inner edge either of
 “ the guide blades, or vanes, or of the rotating blades or vanes,
 “ when guide vanes are not employed, and terminating in a
 “ point.” “A similarly formed conical or ‘ogival’ guide con-
 “ ducts the air or other gas or fluid from the revolving vanes, or
 “ from the guide vanes when such are employed on the outlet
 “ side, down to the decreased diameter of the outlet tube.”

[Printed, 1s. Drawing.]

A.D. 1862, June 3.—N^o 1670.

GURNEY, GOLDSWORTHY.—“Improvements in apparatus for
 “ production and application of artificial light.” These are, first,
 “ for producing gas by heat from oil, oleagenous seeds, coal, rosin,
 “ or other material proper for the production of carburetted or
 “ bicarburetted hydrogen gas; also for generating oxygen gas
 “ from oxide of manganese or other material,” using a cylindrical
 oblong air-tight vessel of “iron, plumbago, or other material
 “ which will stand furnace heat.” This is traversed by a steel
 rod working through a stuffing box at one end of the retort;
 welded to the end of this steel rod is a semicircular plate of steel
 forming a hoe or scraper made to fit half the diameter of the
 vessel, and along a portion of the rod is a fin-like plate. This
 apparatus is for stirring the materials, and when they are spent

removing them by an opening near the stuffing box into a chamber below. The material for producing the gas, "if liquid, is "dropped through an ordinary inverted syphon tube or pressure "can." If solid, it "is first run into an air-tight vessel standing "upright having two stop-cocks affixed to it, one at each end, "one above, and the other below." These are at the end furthest from the stuffing box. The gas passes from a pipe at the opposite end surrounded by cold water; any oil condensed falls into the discharge chamber the gas passes to a gasometer, or in preference an apparatus described which resembles a gasometer.

Second, in applying artificial light, placing a lamp, &c. in the focus of a parabolic reflector standing on a level with its plane horizontal and its axis perpendicular. The rays are made to impinge on a plain mirror standing at 45° with the horizon. If it be required to sweep the horizon the mirror must be revolved. If the light be not required to be seen at great distances, the luminous rays may be made to impinge on a white ball or cone.

[Printed, *sd.* Drawing.]

A.D. 1862, June 5.—No 1703.

NEWTON, WILLIAM EDWARD.—(*A communication from Aristide Cavallé Coll.*)—"Improvements in the construction of organs "and other wind instruments, parts of which improvements are "also applicable for regulating the pressure and flow of gas and "air." These are in reference to this subject as follows:—"The "compressed air is admitted to the first compartment, from which "it passes through an opening regulated by a valve to a flexible "chamber" called "the recipient;" from this chamber "it passes "through a suitable opening to another chamber, and from "thence to the organ pipes. The stem of the valve, which "regulates the exit of the air from the first chamber into the "recipient or flexible chamber is secured to the moveable lid of "the latter, and consequently, where the flexible chamber is "inflated by any undue pressure of air, it will wholly or partially "close the valve. An adjustable weight is adapted to the "moveable lid of the chamber for the purpose of regulating the "pressure. It is sometimes found convenient to adapt to the "receiving chamber an adjusting or regulating apparatus named "the corrector." "This consists simply of a curved tube, "which conducts the air direct from the first compartment to the

“ last, without allowing the whole volume to enter and be dispersed in the receiving chamber. A small opening is, however, made in the curved conducting tube, in order to allow the pressure to be equalized by the flexible chamber. By this means sudden fluctuations of pressure will be prevented. It will be evident that apparatus constructed on the principles above set forth, may be adapted to the exit pipe of a gas meter, or to an ordinary supply pipe for the purpose of regulating the pressure.”

[Printed, 1s. 6d. Drawings.]

A.D. 1862, June 9.—N° 1718.

KEELING, JOHN.—“ Improvements in apparatus for the manufacture of gas.” These are said to be “ the construction of that part of the apparatus referred to as the second chamber ” afterwards described. The apparatus consists of an oblong box divided into three principal chambers, the first serving as a tar cistern, the second as a condenser, and the third a purifier. The coal, &c. is carbonized in the usual way for making gas, the hot gas is conveyed into the first chamber where its temperature is lowered and “ much of its tar and ammoniacal liquor is there deposited,” from thence it passes on by a pipe into the second chamber containing water, “ the upper part of which is divided into a number of secondary wedged-shaped compartments communicating with each other, the inlet to each being larger than the outlet, in the proportion of two to one, so that when the gas enters the first compartment it enters freely, but as it makes its exit, the outlet being smaller than the inlet, its passage is retarded ;” by “ this means it is made “ to deposit more completely the remaining tar and ammonia hitherto held in suspension,” almost the whole of which will fall to the bottom, from whence it may be drawn off by a cock at the bottom. The gas passes by a pipe from this chamber into the purifier and from thence it passes to the gas holder. “ Should it be deemed desirable to take out the whole of the ammonia from the gas, sulphuric or other suitable acid may be mixed with the acid contained in the middle chamber, but in such case it will be necessary to line the interior with lead or other material capable of resisting the action of the acid.”

[Printed, 8d. Drawing.]

A.D. 1862, June 10.—N° 1733.

APPOLD, JOHN GEORGE.—“Improved apparatus for regulating the discharge of water and other liquids and air and other gases.”

This invention relates to a novel arrangement of automatic apparatus, whereby liquids under varying pressure may be supplied at a uniform pressure. “This result I obtain by mounting in a suitably shaped chamber, through which the water or other fluid is passed, a swing valve, the movement of which” (under the excess of pressure of the fluid) “from its vertical position will contract the discharge passage, and thereby limit the discharge” of fluid.

[Printed, 8d. Drawing.]

A.D. 1862, June 12.—N° 1749.

LERENARD, AUGUSTE AIMÉ.—“A new and improved cement or mastic for making joints of steam, water, or gas pipes or chambers.” This consists as follows:—First, “employing india-rubber more or less vulcanized to make a cement or paste fit for making joints of steam, water, or gas pipes, by combining and mixing by a suitable trituration, vulcanized or non-vulcanized india-rubber in various proportions, with powdered, mineral, or earthy substances among others, and especially with a powdered hydraulic cement, fire-clay, and flowers of sulphur.”

Second, “the formation of sheets of various thicknesses by mixing in the cement some hemp or other textile material cut in small pieces and cutting rings, square bands, or strips from the said joints for making joints.”

Third, “using the same cement in a softer or more liquid state that is to say, containing less powdered cement and sulphur to make joints with strips of hemp daubed up or coated with this india-rubber solution.”

“The best proportion of the materials required to obtain 40 pounds weight of the cement” for making steam joints are 12 lbs. of old india-rubber more or less vulcanized trituated between rollers, and melted in a pan with 25 to 30 per cent. of heavy tar oil, and this solution is mixed with “16 pounds of either Portland, Pouilly, or any other powdered hydraulic cement” under rollers, and when thoroughly mixed adding

8 pounds of pure fire-clay and again mixing and finally mixing "with heat, and adding 18 ounces of flowers of sulphur." To form a thinner mixture less cement and less sulphur is used.

[Printed, 4d. No Drawings.]

A.D. 1862, June 20.—N° 1815.

DUPUCH, JOSEPH GUSTAVE.—(*Provisional protection only.*)—"Improvements in cocks for regulating the supply of gas." These are "the back of the barrel is provided with a perforated rotating valve worked by a key projecting from the centre of the back end of the plug, and the entire arranged in such manner that the plug can be removed from the barrel when the said valve is in the position in which the same entirely shuts the opening by which the gas enters into the cock; the plug has a pin gliding in a groove provided in the inside of the barrel so as to serve as a guide for the full opening and the proper working of the cock. A moveable spring fixed with one end by means of a set screw to the front part of the barrel presses with its other end on the top of the plug and thus prevents this latter from unduely leaving the barrel, and a small tumbler, if required, allows the gas company's servants to fix the plug in such a position as not to permit any gas passing through the cock, which position of the plug becomes apparent from the street, the end of the tumbler being in that case inserted into a corresponding hole of the door of the cock's casing. A screw plug at the back of the barrel allows the cleaning of the cock and of the entrance tube for the gas, for which purpose the cock may be turned round in its fittings, these latter being conically with a small cylindrical end."

[Printed, 4d. No Drawings.]

A.D. 1862, June 20.—N° 1822.

TAYLOR, JOSEPH WALTER.—"Improvements in valves, and in means for regulating and indicating the flow and pressure of fluids."

"The improvements in valves consist in forming the plugs thereof of india-rubber . . . For indicating the pressure of liquids I apply a small ram or piston in a cylinder, the lower end of which ram is pressed on by the fluid, whilst the upper end acts by links or connecting rods upon weighted levers to raise the

“ weights thereof as the pressure increases, and at the same time
 “ an axis with pointer is set in motion to indicate the pressure
 “ exerted.”

“ To regulate the flow of water obtained by condensation, “ I
 “ apply to a chamber used as a receiver of such water, an outlet
 “ passage with a valve (capable of closing the same) to which is
 “ applied a float adapted to open such valve with the rise of the
 “ water in such chamber and admit of the escape of such water,
 “ whilst at other times the tendency is for the valve to be
 “ closed.”

To regulate the flow of gaseous fluids, they are made to pass
 through a chamber having a cover which can be weighted, and
 which “ has a rim projecting downwards into a trough of mercury.
 “ . . The gas passes into this chamber by a passage regulated by
 “ a valve suspended from the cover referred to, and this passage
 “ is formed in a block with a surrounding edge also dipping into
 “ a channel of mercury.”

[Printed, 10d. Drawing.]

A.D. 1862, June 26.—N^o 1876.

PARKES, JOHN.—“ Improvements in gas lanterns.” These are
 “ the arrangement and construction of parts forming the lamp
 “ substantially ” as follows :—The lanterns are the globular ones,
 “ suitable for suspending in railway stations and other public
 “ places :” the framework consists “ of a series of segmental
 “ ribs to which the glass is fitted.” Three rings are employed in
 the frame, “ two small ones, one each at top and bottom and one
 “ large one at the middle or equatorial line.” The small rings
 of a thin strip of metal, presenting the edge to the light. The
 middle bead is narrow and without openings. The only openings
 in the lamp being above and below. This lamp is supported with
 three rods united to the middle bead and meeting at top in a
 single pendent arm or branch, or they may be otherwise supported.
 “ The gas duct passes down one of the arms to the mid-ring,
 “ and there enters the globe and descends to a suitable position
 “ for the jet.” It is preferred to place the stop-cock “ imme-
 “ diately under the jet and concentric with the lower opening in
 “ the lamp, the elbow being formed with a stop-cock, in which
 “ the gas passage emerges at one end of the axis, with a view to
 “ that object.”

[Printed, 10d. Drawing.]

A.D. 1862, July 2.—N^o 1934.

WEBSTER, JAMES.—“Improved apparatus for the manufacture of gas for illumination.” These are “the employment of a vertical archimedean screw in a vertical retort, and the vertical “condenser,” as follows:—In generating gas from solid substances it has been found “convenient to place a worm wheel “on the upper end of the axle of the vertical screw, which should “be made to fit or nearly so the sides of the retort. Into this “worm wheel gears a snail or worm, on one end of the axle of “which is a crank or winch handle, whereby the worm is “rotated,” to carry down the carbonaceous matters in the retort surrounded by fire in the fire-place. The upper end of the retort terminates with a hopper. The lower end terminates in a close chamber below, in which the coke is discharged, and into which the gas is driven, and from which it is drawn off into a condensing and cooling apparatus, consisting “of a vertical column of a suitable height provided internally with a vertical screw, which fits “the interior of the column,” and from thence it passes into a syphon pipe and through a purifier into a gasholder. “When “the apparatus is to be used for generating gas from oils or “liquid substances a reservoir containing the oil or liquid substance is placed above the level of the retort, and a regulated “quantity of the liquid is allowed to escape from the reservoir “down a syphon tube, and drop on the thread of the screw “in the vertical retort.” and the gas is conducted as above. “When the vertical screw has become inconveniently charged “with a carbonaceous deposit it may be cleaned by working “some coke or sand down the retort by causing the screw to “rotate.”

[Printed, 1s. 4d. Drawings.]

A.D. 1862, July 5.—N^o 1953.

WARNER, ARTHUR.—“Improvements in preparing materials “for and in purifying coal gas.” These are employing “the “cinders or oxide of iron obtained from puddling, reheating, and “refining furnaces used in the manufacture of iron,” prepared as follows, by first grinding or stamping and sifting them “through sieves with holes, by preference of about one-eighth “to one-sixth of an inch square;” if they contain much dirt or impurities “it is desirable that the same should be washed out.

" before the cinders are used." "The sifted oxide is used in what are called dry lime purifiers or those wherein other oxides of iron are used and in like manner thereto, and such cinder or oxide is generally used in a damped state, but this is not essential."

The above prepared material when "used for the first time to purify coal gas, the sulphuretted hydrogen is not so fully and effectually acted on as when using hydrated oxide of iron as is now very largely employed," and it is only when this material has been further prepared that it fully and effectually acts on it; "hence it is desirable when using a quantity of such cinder or oxide for the first time to combine it with a quantity of other like cinder or oxide which has been before used and has been subsequently prepared by the action of atmospheric air." After the material has been used until it has not sufficient power for purifying gas, it is "removed from the purifiers and made up into heaps in the open air till the same becomes heated, when the cinder or oxide is to be spread and turned over from time to time till it becomes again suitable for use which will generally be the case in a few days, depending upon the state of the atmosphere." The materials "thus prepared, not only retain the property of removing carbonic acid and ammonia which they are found to possess when used in the first instance, but they are rendered more effective in removing also the sulphuretted hydrogen from coal gas."

[Printed, 4d. No Drawings.]

A.D. 1862, July 7.—N^o 1955.

KIDD, JOSHUA.—"Improvements in gas meters." These are said to be "the combination of a regulator with a meter having one or two measuring chambers;" "the mechanical arrangement of levers and parts described for working the valve and index, likewise the means of adjusting the capacity of the measuring chamber," as follows:—These meters are constructed with "one or two measuring chambers instead of three or more, as meters are made at present," and with the meter is combined "a regulator, by means of which a regular supply of gas is given to the burner at an unvarying pressure. The measuring chamber is placed in the interior of a drum or outer case, and may be worked as an ordinary bellows or by mercury as in a mercurial

“regulator, and is so arranged that as it takes in and discharges the gas, it gives motion by means of levers to a mercurial level which it causes to turn upon a centre. The motion of the mercurial level opens and shuts the outlet and inlet valves for the entry and exit of the gas, and also turns the index or registering wheels of the meter.” To the top of the inside of the case is attached “a loose flexible diaphragm fastened in the centre to the top of the measuring chamber, so that when the measuring chamber falls and discharges the gas contained in its interior into the case or drum it draws down the flexible diaphragm, thus keeping up a regular supply of gas to the burner, and by this arrangement at the moment that the outlet and inlet valves are turning on their centres the gas for a moment is shut off, and the flexible diaphragm before-mentioned pressing upon the gas contained in the drum or case keeps up an unvarying or equal supply of gas to the burner.”

[Printed, 1864. Drawing.]

A.D. 1862, July 7.—N^o 1957.

EDWARDS, THOMAS.—“Improved movement for the indices for gas, water, and other fluid meters.” This is said to be, first, the use and application of the peculiarly formed tappet wheels and lateral pin-toothed wheels, or any mere modification of the same afterwards described, when applied to the construction of the movements of indices for the above purposes. Second, casting these tappet and pin-toothed wheels on their axis or shafts as afterwards described. Third, casting the back and front frame plates of meter indices with the holes ready to receive the ends of the wheel shafts and pillars or any mere modification of the same. Fourth, constructing and forming the worm pinion for meters by casting or cutting it “with a milling tool, that its oblique and curved teeth are of equal and uniform depth throughout.” Fifth, “the general construction, arrangement, form, and combination of the various parts of the index movement.” The system of wheels “consists of a smooth-edged wheel with a convex-sided slot formed across the periphery thereof, and having a short tappet or stud pin formed on the side of the wheel and projecting radially across one side of the slot.” This wheel, which is termed “a tappet or power-transmitting wheel, and which acts consecutively on a series

“ of (say ten) pin teeth springing at a right angle from one side
“ of a wheel, the periphery of which is formed with a series (say
“ ten) concave segments of a circle having a common radius with
“ the tappet wheel.” The several wheels used for the above
purposes are all cast on their respective shafts or arbors, in preference, previously squared up at the outer ends. The shafts or arbors are in preference of brass and coated with tin between the bearings to cause the fluid metal forming the wheels to adhere more readily thereto. “ It is preferred to cast the wheels of white
“ metal in a metal matrix. The first motion wheel (in say a
“ gas meter) is one of the tappet wheels described, cast upon the
“ horizontal shaft which carries the pinion, into which works the
“ worm on the upright driving shaft used in ordinary meters,
“ and works into a lateral pin-toothed or communicator wheel
“ cast on the shaft which carries the hundred's pointer, and on
“ which shaft is also cast a second tappet wheel, precisely similar
“ to the first motion wheel, and which also works into a second
“ lateral pin-toothed wheel cast on the shaft carrying the pointer
“ indicating the thousands, which shaft also carries a third tappet
“ wheel, which works into a lateral pin-toothed wheel on the
“ shaft of the pointer indicating the tens of thousands. The
“ whole of the pointer shafts or arbors are mounted parallel to
“ each other between two plates,” which, in preference, are “ cast
“ in a metal mould and from white metal, with the holes for
“ the bearings of the several shafts or arbours and pillars formed
“ therein.”

[Printed, 8d. Drawing.]

A.D. 1862, July 7.—N^o 1958.

McGEARY, JAMES.—(*Partly a communication from Edward Leman Norfolk.*)—“ Improvements in the manufacture of gas
“ and the apparatus to be employed for that purpose.” These
are said to be, first, “the use or employment of steam in a
“ highly superheated and thoroughly dessicated condition in
“ combination with a suitable liquid hydrocarbon.” Second,
“ passing steam which has been previously highly superheated
“ through amongst charcoal, or its equivalent, in an incandescent
“ state, contained within a retort or retorts, and thoroughly carburetting it or charging it with the requisite amount of gas
“ generated in another retort from a liquid hydrocarbon whilst
“ such hydrocarbon is in course of being converted into gas.”

Third, "making illuminating gas from a liquid hydrocarbon and steam (the steam having been first highly superheated) by a continuous process by which the quantity of the steam and hydrocarbon which is admitted may be varied." Fourth, the apparatus afterwards described for manufacturing illuminating gas. The apparatus preferred consists of two retorts either of L-shape or other convenient form and connected with each other. "The retorts are filled with charcoal or its chemical equivalent. Into one retort is driven or discharged steam under suitable pressure and free from moisture in a highly superheated state amongst the charcoal, where it is decomposed and "a compound gas being a mixture of light carburetted hydrogen and other gases is the result;" this is "conveyed (under pressure) through a connecting pipe to a second retort or vessel (also filled with charcoal, coke, or other suitable material), but in the course of passing from the one to the other a fluid hydrocarbon best suited, passes continuously under regulation from a tank at a suitable level into "the highly heated vessel, conduit, or connection, and so becomes combined with the compound hydrogen gas from the first retort and passes through the second into the receiver.

[Printed, *8d.* Drawing.]

A.D. 1862, July 8.—N^o 1961.

JOHNSON, JOHN HENRY.—(*A communication from Joseph Jean Marçais.*)—"Improvements in wet gas meters." These relate "to the prevention of fraud on the part of the consumer," and are for the purpose of preventing "the fraudulent discharge or withdrawal of water from wet gas meters by the well known practice of tipping the meter from a horizontal to an inclined position, it is proposed to employ a pipe which is connected to the water outlet and is carried round or partly round the meter, so that on elevating one side or the front or back of the meter, one or other of the two ends of this pipe must be elevated above the water line, hence the impossibility of pouring out or discharging any water from the meter by that source. This tube or pipe should be of larger bore than that of the nozzle or orifice for the escape of the water, so as to prevent a syphon action arising. The same system of pipe surrounding a portion of the meter is equally applicable to the gas syphon

" pipe for accomplishing the same object. In order to prevent
" the extraction of water through the supply pipe by means of a
" small pump or filter, a grating is inserted therein, which will
" effectually obstruct the passage of any apparatus therethrough,
" but will at the same time leave the water free to enter the meter
" when supplying the same. A valve may also be inserted inside
" the gas outlet pipe, opening upwards, so as to allow the gas to
" pass freely, but closing instantly should any attempt be made
" to force the water out by blowing into the meter. A baffle
" plate or obstructor may also be placed inside the gas outlet
" pipe, with a view to preventing the introduction of any piercer
" or perforating instrument intended for puncturing the surface
" of the measuring drum."

[Printed, 8d. Drawing.]

A.D. 1862, July 14.—N^o 2025.

PARKES, FREDERICK MAJOR.—" Improvements in the manu-
" facture of gas for lighting and heating, and in apparatus
" employed in the said manufacture." These are said to be, " the
" manufacture of gas by combining gas from petroleum with
" hydrocarbon or water gas," and the arrangement and combi-
" nation of parts constituting the three-chamber retort " afterwards
" described. Petroleum gas is obtained by " subjecting the oil
" which may be used either in its crude or refined state (but
" preferring it in the crude) to the action of heat in a retort set
" in a gasmaker's ordinary furnace, preferring a temperature of
" between 1700° and 2000° Fahrenheit," at which temperature it
" is preferred " to keep the retort in all the operations herein
" mentioned." " The hydrocarbon or water gas may be obtained
" by any of the ordinary methods," but that which is preferred is
" to drive a jet of steam from a boiler into coke or charcoal
" mixed with scrap iron placed in the retort." Sometimes also
" in producing hydrocarbon gas, setting " raw wood in the retort
" at the first in lieu of charcoal or coke." The gases so made
" are mixed " in another retort or compartment, preferably in the
" proportions of 10 of water gas to 1 of petroleum gas, but
" altering the proportions according to the degree of illuminating
" power " required. A retort is described which is divided
" longitudinally into three compartments, the partitions in each
" case do not quite extend to the back end of the retort, but leave

at that part a space "which communicates with the three compartments, and forms a passage common to them all." The hydrocarbon gas is made in the upper compartment, and the petroleum gas in the lower one, and they unite together and are heated in the middle one, and from thence the gas passes into the ascending main and into the holder. Several other arrangements for making the "mixed or combination gas" are described.

[Printed, *ed.* Drawing.]

A.D. 1862, July 14.—N^o 2026.

DRAKE, OLIVER PERRY.—"A new and useful or improved apparatus for vaporizing and aerating a liquid hydrocarbon to be burned for illumination or for other purposes." This consists as follows:—"One of the products obtained from the distillation of petroleum oils and bituminous coals is a colorless liquid having an ethereal odour, and being the lightest in specific gravity of all known liquids." By the automatic operation of this apparatus and without the application of artificial heat, "such product may readily be converted into a dense gas and combined with a sufficient quantity of atmospheric air in order to produce when on fire, a brilliant and luminous flame." For these purposes a tight cylindrical or other proper shaped vessel, its end being closed by two convex heads, is used. This vessel is divided into two chambers, of which the front one is the pump chamber, and contains the revolvable air pump partially immersed in water with which the said chamber is to be supplied. The other chamber is to contain the liquid hydrocarbon and a revolvable generator; above this vessel is another cylindrical or other proper vessel open at top and closed at the bottom." When in use this upper chamber should contain water as high as a vent screw, or about two-thirds the height of the vessel. A regulator or airometer is located in this vessel, "it being an inverted bell or cup having its lower edge dipping into the water some two or three inches when the bell is at the extreme of its elevation within the said cylinder."

[Printed, *ed.* Drawing.]

A.D. 1862, July 18.—N^o 2052.

MORRILL, OSCAR FITZALAN.—"A certain new and useful apparatus for generating heat for culinary or various other

" purposes." This consists, first, "in a combination of apparatus consisting of a hydrocarbon vapor and air-mixing-chamber or vessel, a foraminous burner or cap thereof, a reservoir for holding a liquid combustible hydrocarbon, a vaporizer, and, finally, a conduit leading from the vaporizer into the mixing chamber or mixer, and this whether the vaporizer be provided with or be without a wick, and be heated either by the flame of said burner, or by a separate one or its equivalent applied to the vaporizer."

Second, applying or arranging the vaporizer and its conduit with the mixing chamber, "whereby by a movement of the said reservoir either towards or away from the said mixing chamber and the burner, the amount of production of hydrocarbon vapor may be regulated, and such vapor be conducted into the mixing vessel."

Third, "an aerovapor-burner broiling apparatus, or steak broiler, as made not only with a deflector in its grid or grate, but with a gravy trough and a flame and heat passage arranged underneath the grid, and with respect to one another."

Fourth, "the combination of a removable boiler-supporter and a series of cap rings and cover with the aerovapor heating apparatus."

Fifth, arranging "the receiving mouth of the vapor conduit above the lower part of the interior of the vaporizer."

Sixth, extending the vapor conduit into the vaporizer, and over the burner.

Seventh, "constructing the screw of the reservoir with a central core or projection, or with the same and an annular and concentric recess arranged within it, and to receive a washer when placed within the screw of the cap and on such projection."

[Printed, *8d.* Drawing.]

A.D. 1862, July 18.—N° 2054.

ABBOTT, JOSEPH RICHARD.—"Improvements in sliding chandeliers, gasaliers, and other pendent lamps." These are, "in making gas pendants upon the water slide principle. The centre tube is required to be only the length that may be necessary for the pendent to be lowered," employing "four tubes in this case instead of three; the outer tube terminates at its upper

“ end in a gas box or reservoir communicating with the pipes
 “ supplying the gas to the burners. Inside this tube is fitted
 “ the usual hydraulic slide apparatus working through the gas
 “ box or reservoir before named, and furnished with its pulleys,
 “ chains, and balance weights, the water cup being above the gas
 “ reservoir; inside these slide tubes is fitted the tube leading the
 “ gas from the main pipes. The gas passing down this tube
 “ passes upwards between the water slide, and the outer or fourth
 “ tube into the reservoir, and thence down the supply pipes to
 “ the burners.” In making pendants with the cork slides or
 stuffing boxes only two tubes are required, “ the stuffing box is
 “ fixed either within the gas reservoir or immediately on the top
 “ of it, so that it works up and down with the outside tube and
 “ the reservoir.” “ For chandeliers and oil or other pendants
 “ than those used for gas, the same arrangement as that last
 “ described is employed, omitting the cork slide or stuffing box,
 “ which is only required for gas.”

[Printed, 8d. Drawing.]

A.D. 1862, July 30.—N° 2165.

CLARK, WILLIAM.—(*A communication from Jean Jouret.*)—“ Im-
 “ provements in gas burners.” These are, “ the application of a
 “ small cap or thimble of “ metal gauze of iron, copper, steel,
 “ platina,” “ to gas burners, especially those termed fish-tail
 “ burners,” forming a close-fitting cap over them. The edges of
 the thimble or cap are fixed to the rim of the burner. It is said
 that “ this cap will be found very efficacious, as it introduces a
 “ metallic body into the centre of the flame which thus becomes
 “ heated, while it further counterbalances or regulates the initial
 “ pressure of the gas.”

[Printed, 6d. Drawing.]

A.D. 1862, August 6.—N° 2206.

VALENTIN, WILLIAM GEORGE, and LEVICK, FREDERICK.—
 “ Improvements in the generation of combustible gases for
 “ lighting and heating purposes; and in the mode of applying
 “ such gases to the manufacture of iron, glass, and other pro-
 “ cesses in the arts where great heat is required.” These are said
 to be “ the arrangement and construction of apparatus ” for
 “ generating combustible gases from carbonaceous matters by

"the decomposition of steam or water;" the mode "of heating the retorts or generators externally for the purpose above mentioned;" and "the mode of constructing and applying the concentric burners and tuyeres to heating flues and to puddling or other furnaces, or for other heating purposes" shown and described. By passing steam " (common or superheated, but by preference the latter) through a mass of incandescent fuel, such as coal, coke, or charcoal," the steam will be decomposed, and the hydrogen will be set free, and part thereof will combine with carbon, producing carburetted hydrogen," and the oxygen will form carbonic oxide, and more or less carbonic acid. As the steam passing through the incandescent fuel would lower the temperature so much as to prevent its decomposition, the temperature of the retorts is kept up by heating them from the outside by forcing in combustible gases and air through suitable tuyeres into chambers surrounding the retorts, and when a large mass of coked coal in a highly incandescent state exists, a blast of hot air and steam is admitted through tuyeres in front of the coking chambers. When an illuminating gas is required, the superheated steam is first passed through a mass of coal tar or other liquid hydrocarbon before it enters the retort or decomposing chamber. The combustible gases should be delivered from the tuyeres or burners in a highly heated state; for this purpose the tuyeres or burners are made annular, and have a central jet for the hot blast, and the combustible gases issue round the central jet. Modifications of the burner are described.

[Printed, 1s. 6d. Drawings.]

A.D. 1862, August 7.—N° 2212.

DE FENIS DE LACOMBE, FRANÇOIS HENRY MARIE CÔME DAMIENS CHEVALIER.—"Improvements in the means of lighting towns or other localities, and of ventilating, warming, and providing the same with water." These are, "making atmospheric air subservient as a means for lighting towns or other localities, or the dwellings thereof, by causing the said air to pass through or come in contact with any suitable volatile liquid hydrocarbon, so as to become sufficiently impregnated with the volatile parts of the said hydrocarbon for allowing the air thus impregnated to be ignited and burned by suitable burners, provision being made in the mains, pipes, or other

" fittings by proper branch pipes or other suitable means, for
" allowing to convey into the town or other locality, or the
" dwellings thereof, fresh, pure, or cool air for ventilating or
" cooling the same, whereas this air if properly heated may also
" serve for warming the same."

[Printed, 4d. No Drawings.]

A.D. 1862, August 9.—N° 2234.

MOREAU, ALEXIS JEAN, and RAGON, ADOLPHE ERNEST.—
" Improvements in the manufacture of gas and coke." These
are the following "mode of generating gas and manufacturing
" coke, and also the apparatus" employed. This "relates prin-
" cipally to the manufacture of gas from peat or from chemical
" substances contained in peat," but it "may be advantageously
" employed for obtaining gas from coal or other substances from
" which it may be generated." The gas generating apparatus
consists principally of two retorts placed side by side, "which are
" heated externally by suitable fires, and are charged from time
" to time with the peat or other substance from which the gas
" is to be generated." "The vapours that are distilled over are
" conducted to a separate vessel or retort" placed above, which
is "also heated and contains a mass of incandescent coke and
" fuel, and is divided longitudinally by a central partition, which
" does not quite extend to the end of the retort, so that a space
" is left for the passage of the gases from one compartment to
" the other." The gases or vapours pass from the two retorts
through pipes into the front part of one of the compartments of
this upper retort, "where they are heated by passing through the
" incandescent fuel round the end of the partition" to the other
compartment, and "from thence through the exit pipe to the
" purifiers, and ultimately to the gas holder."

[Printed, 8d. Drawing.]

A.D. 1862, August 15.—N° 2300.

SHEPARD, ANNE. — (*Provisional protection only.*) — "Im-
" provements in obtaining light and in apparatus connected
" therewith." These are "combining oxygen gas or carbonic
" oxide at or near the point of combustion with the vapour of
" naphtha or other hydrocarbon oil, for the purpose of obtaining
" light, causing "the hydrocarbon vapour, either separately or

"combined with carbonic oxide, or any heating or illuminating gas to mix at or near the burner with the necessary quantity of oxygen gas required to produce complete combustion." The oxygen gas is obtained from any known process, but, in preference, it is obtained by decomposing "sulphuric acid or other combination of sulphur with oxygen" "in a suitable red-hot retort, and then causing the sulphur to combine with lime, an alkali, or other substance for which it has a greater affinity than for oxygen." For generating the hydrocarbon vapour any convenient form of apparatus may be used, but "the principle of drawing up the oil from the receptacle holding the same by capillary attraction" is preferred. "The carbonic oxide intended to be naphthalised" is made by passing "carbonic acid gas, the result of combustion from any burning body," through "red-hot charcoal or other form of carbon in a highly heated state." The light may be intensified by causing the ignited gases "to impinge against a stationary disc or body of lime, magnesia, or asbestos, either together or combined, the gas jet or burner in this case is made moveable and caused to travel over the surface of the stationary disc of lime or other substance."

[Printed, 4d. No Drawings.]

A.D. 1862, August 18.—N° 2313.

BARNETT, FREDERIC.—"An improved lamp or lantern for street lighting and other purposes." This consists in constructing "lamps or lanterns" so as to have "a better development of reflection of gas or other light," "the same to be obtained in conjunction" with the enamelled reflectors described in No. 2316, A.D. 1861, or with other apparatus in lieu thereof, also by a regular current of air to prevent the fluctuation of the flame. Also "an arrangement to light the said lamps without a ladder or trap in the bottom of the lamps." These lamps "have a greater diameter in their upper parts, near the covers or domes, than have the ordinary ones," and diminish rapidly towards their lower parts until they are reduced to less than one-third, and "no larger than that part of the capital of the lamp post on which they are fixed, so as to cause little or no shadow." In the base of the lantern is a glass neck descending one or more inches, large enough "to pass the pipe supporting the burner,

" and enough air to feed the flame." The tap for turning on or off the gas is between the lamp and the lamp post, and is capable of being opened or shut by means of a stick from below. In the upper part of the lantern is placed in its longest diameter an enamel reflector, having "one or more oval or round holes, " according to the quantity and nature of the burners," which are surmounted by conical chimnies six or eight inches high. For the purpose of lighting the gas, &c., "from the foot path, " without a ladder," the door of the lantern "opens on a hinge " placed on the upper part of the door." On the lower part of the door is a piece of metal or bolt, which is made to shut " into a spring catch fixed solidly on to the lower frame of the " lantern." From this spring catch there extends "a spur " some few inches, which when pressed back, causes the catch " to relinquish its hold on the bolt," and thus the door will be opened. The lamp is ignited by a lighting staff.

[Printed, 10d. Drawings.]

A.D. 1862, August 27.—N^o 2380.

NEWTON, WILLIAM EDWARD.—(*A communication from George Hand Smith.*)—"An improved method of producing light for the " various purposes of artificial illumination." This consists, first, "in the use of common atmospheric air in the place of " oxygen gas in the combustion of illuminating gas or its equivalent for the production of an intense degree of light when " such atmospheric air has been previously heated, and in that " state is forced by properly arranged jets into intimate contact " with the illuminating gas at or before the moment of combustion, both being at the same time made to impinge upon a " suitable piece of lime or other known equivalent substance."

Second, "the use of common atmospheric air in the combustion of illuminating substances, such as illuminating gas, " oils, or hydrocarbons, or their equivalents, for the production " of an increased degree of light, when such atmospheric air has " been previously heated, and in that condition is brought in " intimate contact with any of the said illuminating substances " at or before the moment of combustion." The air passes through a pipe regulated by a stop-cock into a chamber in which are a number of copper or other wires heated by a gas burner, from this chamber the air issues by a rather long jet, around which

is a passage into which the illuminating gas enters, so that the heated air enters the channel with the illuminating gas just before the point of ignition.

[Printed, 6d. Drawing.]

A.D. 1862, August 28.—N° 2390.

LACHENAL, ELIZABETH.—(*A communication from Louis Lachenal.*)—"Improvements in gas meters." These are as follows:—"The meter is composed of a rectangular case, the interior of which is divided into two equal measuring compartments by a flexible partition. "In order to give motion to the valves, which "alternately permit gas to enter into and to escape from the two "measuring compartments," an arm in connexion with the flexible partition and with certain levers, pin jointed to it and to the bottom of the case, projects through a slot in the top of the case. An elastic diaphragm allows of the full rocking motion of the lever in the slot without permitting the passage of gas. An upper case contains the valves, and is divided into two compartments by a partition at right angles to the above-mentioned flexible partition. The rocking lever, in connexion with springs and another lever, moves slides over the valve faces; two pipes in one compartment of the upper case serve as inlet pipes, "to alternately supply both measuring compartments with gas," "two other pipes in the other compartment "serve as outlet pipes from "the measuring compartments;" gas therefore always enters the apparatus, and is always discharged from the same when the meter is at work, one side acting alternately as a receiver and dispenser of gas, and when one side receives the other gives out its gas. The oscillation of a "crank pin" on the valve axis gives motion to the pawl of the counting apparatus. The Drawings show a pendulous lever instead of a crank pin.

[Printed, 1s. 4d. Drawings.]

A.D. 1862, September 1.—N° 2423.

JOHNSON, JOHN HENRY.—(*A communication from Ernest Ulysse Parod.*)—"Improvements in apparatus for regulating or "controlling the working of motive power engines; applicable "also to the regulation of the flow of liquid, air, or gas, through "pipes or conduits." These are as supplied to a steam engine, "the steam as it passes along the steam pipe from the boiler to

“ the cylinder acts upon a fan or pallet wheel contained in a suitable casing, and by rotating that wheel at a higher or lower velocity,” causes “ a corresponding rotary motion to be imparted to a horizontal disc carrying two sliding weights, which, on the velocity increasing, separate and act upon a sliding boss through inclines, or by means of jointed links, so as to elevate the boss or collar on its shaft, or allow it to descend, according as the speed rises beyond or falls below a proper rate of working. This rising or falling of the boss causes one or other of two collars or shoulders formed upon it to come into contact with the upper or under edge of a friction pulley, fast on a short spindle, which transmits motion by suitable gearing to a nut acting upon the screwed spindle of a regulating slide valve inside the steam pipe.” “ In some cases the regulating slide valve may be dispensed with, and the screw spindle connected directly with a sliding boss or collar on the main shaft on the engine, which boss or collar is provided with a spiral key or feather, upon which the eccentric which works the expansion valve is fitted. By moving this boss or collar to or fro, the spiral feather causes the position of the eccentric to be varied, and effects the cutting off of the steam at an earlier or later period of the stroke as the case may be.” “ These improvements are also applicable to the regulation of the passage or flow of liquids, gas, or air through pipes or conduits, the greater or less quantity being regulated by the flow of the liquid air or gas itself.”

[Printed, 10*d*. Drawing.]

A.D. 1862, September 2.—N^o 2424.

PEEBLES, DAVID BRUCE. — (*Provisional protection only.*)—“ Improvements in wet gas meters.” These are first, placing the float which keeps “ the valve in the inlet chamber used to shut off the gas when the water in the meter is too low,” “ in a compartment open at its upper part to the drum case, and separated from the front case by a partition dipping down below the water. A bent wire passing under the partition connects the float and valve.”

Second, “ to prevent a sudden increase of pressure from throwing water up into the compartment containing the counting mechanism,” having, “ besides the tube usually surround-

“ing the counter spindle, and dipping down below the water surface to seal the communication, a second tube which may either encircle the first or be beside it. These tubes communicate with a small chamber near the top of the case, and within this chamber the spindle has fast on it a disk, and any water thrown up one tube strikes this disk, and being deflected thereby runs back by the other tube.”

Third, “contrivances in connection with a closed fountain chamber for compensating for the lowering of the water level in the meter from evaporation or otherwise. Gas is admitted to the top of the fountain chamber to permit the egress of water therefrom by a pipe communicating with a small cylindrical or conical chamber, which is fitted with a disk, having an aperture at one side,” communicating with the inside of the drum case, adjusted by means of a key to the proper level. “When the water flows below that level, bubbles of gas enter the aperture into the fountain, and a corresponding supply of water flows out either by the same or by a separate aperture.” A small valve is applied to the aperture, and this valve is “actuated by a blade placed in a position to be acted upon by the incoming current of water, which is introduced by a pipe dipping down to the bottom of the fountain, and having a turned up mouth. In a modified arrangement the filling tube is made to dip down into a larger tube closed at the bottom, and the water on entering has to rise up to the top of the larger tube before filling the chamber.” In another modification the fountain is situated at the back of the meter, and the float for shutting the inlet valve is placed in it. Also in another modification “a portion of the front case is divided off by partitions to form a fountain space, and in a part of this space the float of the inlet valve is placed. The inlet valve chamber occupies one corner of the front case, and communicates by a pipe or by a passage forward in the casting with the central compartment of the case, which last compartment communicates with the centre of the measuring drum in the usual way.”

[Printed, 4d. No Drawings.]

A.D. 1862, September 5.—N^o 2453.

HART, HERBERT WILLIAM.—(*Letters Patent void for want of Final Specification.*)—“Improvements in Argand and other

"burners." These are first, applying a regulating top to the chimnies of Argand burners "whereby to regulate the escape of air at the top and ensure better combustion." "The top is formed of two discs, the one fixed the other revolving thereon like an ordinary ventilator; the position of the movable plate is such that where the holes in the one disc coincide with those of the other, the full passage is open." The cover is regulated by a small handle or projection. "A suitable cover surmounts the whole to give it a more or less ornamental finish." These regulating tops are also applied to globes and other like glasses of gas burners.

Second, arranging the chimney of Argand burners so that the bottom or lower part shall be at an elevation of about three quarters of an inch above the issue of the gas," sometimes using in combination with this arrangement of chimney a guard to protect the issue and ignition of the gas; this is an annular piece of glass which surrounds the burner and rises up, say, about one quarter of an inch above the issue of the flame. "This may be supported by the ordinary gallery while the chimney is supported by raised standards; or it may be suspended from above from a globe, if a globe is used to enclose the light."

[Printed, 4*cl*. No Drawings.]

A.D. 1862, September 5.—N^o 2458.

HADLEY, SIDNEY HOPTON.—"An improved process for manufacturing gas for illumination." This is said to be "the production of permanent illuminating gas by the decomposition of steam and volatile hydrocarbon in the state of vapour (the steam and hydrocarbon vapor being mixed while the hydrocarbon is in the nascent state), by subjecting such mixture to the action of red hot carbon." The retort is charged with peat, schale, coals, or other carbonaceous or bituminous substances," and heated "to a temperature not exceeding a dull red heat," introducing at the same time superheated steam which sweeps out "the volatile hydrocarbons as they rise in the retort," and carries them on to a second or decomposing retort in which they and the steam are converted into permanent gas. This second retort is smaller than the first, and is charged "with fragments of coke or wood, or other charcoal" heated to a

bright red heat. "The whole mixture resulting from the decomposition effected in the second retort is good commercial gas," but if it be found necessary to increase the illuminating power of such gas, this is effected "by introducing some liquid hydrocarbon into the second or decomposing retort, suffering it to pass in a small stream."

[Printed, 4d. No Drawings.]

A.D. 1862, September 17.—No 2554.

HASELTINE, GEORGE.—(*A communication from James Edward Thomson and Henry Youle Hind.*)—(*Provisional protection only.*)—"Improvements in apparatus for the manufacture of gas from petroleum oil and water, and from cannel coals, bituminous coals, schists, tar, crude coal oil, or other hydrocarbons and water." This consists "of a generator containing a fire-box, an ash-pit, and a compound retort. The fire-box is lined with fire-brick, and the retorts are constructed of cast-iron or other suitable material." The compound retort consists of two parts, the outer part is hemispherical, or otherwise, and may be vertically or horizontally arranged. The inner part is of a cylindrical or other convenient form. The space between the outer and inner part forms a chamber for the petroleum or other material used. The inner retort consists of two parts or chambers "separated by a grating; the part above the grating is filled or partially filled with charcoal or coke during the process of gas making. The other part is a chamber, at the centre of the bottom of which a smooth piece of brick is placed at a high angle. There are cavities in this part which communicate between the outer and inner retorts." A cover over both is forced on with lead joints; an eduction pipe is attached to this cover and leads to a condenser. Petroleum or other suitable fluid hydrocarbon flows from a reservoir on to pieces of red hot coke or fire-brick contained in the outer retort, and at the same time water flows upon a smooth sloping red hot piece of fire-brick placed at the bottom of the outer retort. The gas from the hydrocarbon passes into the lower chamber and there meets "with globules of water in its spheroidal state," and these become "converted into permanent gases," and "with the permanent gases previously formed and vapour of water, pass up through the grating and through the hot coke in the upper

"chamber of the inner retort" and pass through the eduction pipe and into the condenser.

[Printed, 4d. No Drawings.]

A.D. 1862, September 17.—N° 2555.

JOHNSON, JOHN HENRY.—(*A communication from Jean Christophe Friedleben and Charles Bender.*)—"Improvements in gas burners." These are "the adaptation to gas burners of a valve which is opened or closed by the expansion or contraction of a bar acted upon by the heat of the flame of the jet substantially as follows: the valve is "disposed inside the burner so as "to completely shut off the gas when closed and allow a free "passage through the burner when opened. The opening and "closing is effected by means of a bar composed of two metals "soldered together," such as "an internal blade of iron and an "external blade of zinc, but other metals having similar properties may be employed." This bar is, in preference, of a curved form, and is "secured, by solder or otherwise, at one end to the "exterior of the burner, whilst the other end is in connection "with the valve above referred to. The upper part of the curved "bar is made to embrace the neck of the burner near the orifice." "So long as the gas jet is burning the heat imparted to this bar "causes it to expand or contract (according to the position of "the two metals of which it is composed) and open the valve, "but as soon as the flame is extinguished from any cause the "consequent cooling of the bar causes the valve to close, and "stop all further passage of gas."

[Printed, 6d. Drawing.]

A.D. 1862, September 18.—N° 2560.

BROWNE, WILLIAM HERBERT, and ARMSTRONG, HENRY.—"Improvements in dry and wet gas meters." These are first, "constructing and fitting the valves of dry gas meters with a "loose frame," as follows; each slide valve is connected loosely to a frame "carried over or round the valve, furnished at back "with a pin, which works in a hole formed in an upright, while "the other end of the frame is united to the connecting rod, "whereby motion is communicated to the valve; pins also project from the fore part of the frame, and work in holes formed

" for their reception in other uprights. By means of the frames
" the action of the valves, both in advancing and in the back
" stroke, is the same, that is to say, the valves are drawn in both
" directions in contradistinction to their being drawn in one
" direction and pushed in another."

Second, " driving the rotary valves of dry gas meters from the
" base or lower part thereof," by fixing eyes in the lower part of
the rim of the valve, and passing " a wire or wires fast on the
" valve spindle through such eyes." " The main purpose of the
" improvements, before alluded to, is to prevent the valves from
" being lifted from their seats, and thus allowing the gas to pass
" unmeasured, as occasionally takes place with valves as ordi-
" narily fitted and constructed."

Third, " fitting a partition inside the front chamber of a wet
" gas meter," " forming an enclosure open at top round the
" aperture leading from the float case into the drum of the
" meter," making " the aperture of very small diameter, in order
" to prevent any sudden pressure acting directly or without
" check in the float case, and thereby forcing and keeping down
" the float."

[Printed, 8d. Drawing.]

A.D. 1862, September 19.—N° 2571.

GIERTZ, JOHAN BERNHARD. — " Improvements in gas burn-
" ners or jets." These are said to relate " more particularly to
" gas burners or jets known in the trade as ' bat-wing ' and ' fish
" ' tail ' burners," and consist " in adapting thereto a cap or cover
" of metal " as follows: the cap or cover is " of a dome shape,
" with a thin flat piece of metal across the centre thereof, and
" projecting from the outside thereof about three-eighth parts of
" an inch, leaving a slit or long opening across the said cap,
" close to each side of the aforesaid flat piece of metal, for the
" escape of gas from the ordinary gas burner or jet, over which
" said cap is placed and fits tightly around, leaving a space
" between and around the inside of the cap and the outside of
" the gas burner or jet for the gas to enter and pass through to
" form the flame of the burner." " The effect of this arrange-
" ment is to obtain a large surface of flame with a small quantity
" of gas."

[Printed, 6d. Drawing.]

A.D. 1862, September 25.—N° 2615.

RAYWOOD, JOHN.—“ Certain improvements in the construction of gas apparatus for the prevention of fraud and for economizing the consumption of gas.” These are said to be “ the use and application of the perforated tubes or tube in connection with the plate and diaphragm and the outer case or socket,” and applying and using “ these improvements to meters, fittings, service pipes, and other appendages in such way and manner as may be considered necessary or desirable, and as substantially described ” as follows, “ enclosed in an outer casing of any suitable form or dimensions, and of any suitable material,” is inserted “ one or more perforated tubes of zinc or other material, or of wire gauze or netting,” in which is placed “ a solid plate or diaphragm at a proper distance from the bottom of the casing, so that when the gas comes in contact with or against the underside of the plate it is forced through the apertures of the perforated tube immediately below the plate into the outer case or socket, and it has then to re-enter or pass through the perforations of the tube above the plate before it gets to the burner or top, thus breaking the rush or force but not diminishing the supply, and producing a steady and a better light, and preventing the noise and waste of overdue pressure.”

[Printed, 6d. Drawing.]

A.D. 1862, October 2.—N° 2664.

WILKINS, WILLIAM CRANE.—(*Provisional protection only.*) —“ Improvements in gas burners.” These are, first, in “ using burners formed of two or more concentric rings perforated,” each ring “ is supplied from a separate reservoir or chamber through two or more branch passages,” varying “ in number with the size of the ring with which they communicate, and each of such reservoirs is supplied by a separate pipe or channel with a top or valve adapted to regulate the quantity of gas for the time to be supplied to such reservoir;” applying “ with such burner a glass chimney connected somewhat at a distance a little above the burner rings,” and with “ adjusting means to adjust the height of such contracted part;” also applying “ fine wire gauze or other fine reticulate openwork to regulate the supply of air upwards to the burner,” with a fence between

"such reticulate openwork and the glass chimney." "Each ring of the burner may be perforated with one or more rows of holes." When two rows of holes are employed the holes of one row are arranged so as to intersect those of the other.

Second, to a ring burner with two rows of holes for the passage of the gas to be consumed, applying "an internal cone or inverted ball, by preference, with a passage through it, so that air, in addition to being deflected from the interior on to the flame, may pass through such cone," and applying externally "a cone, the upper edge of which is about on a level with the upper edge of the ring;" outside of this cone is a glass chimney which is contracted or reduced in diameter above the flame. "Between the cone and this chimney air is permitted to flow through perforations." These gas burners it is said "are particularly applicable to lighthouses and such like places, as well as to other uses."

[Printed, 4d. No Drawings.]

A.D. 1862, October 3.—N^o 2671.

BROADBENT, RICHARD.—"Improvements in gas regulators." These are, first, "coating the surface of the ordinary cover with an enamel or coating of glass, earthenware, or other suitable material, for the purpose of protecting it from injury by the action of the gas or moisture thereon. The cover is coated with the enamel both on the main and outer surface, and the mode of applying it is similar to that in ordinary use for enamelling the surfaces of metals."

Second. "Adapting and applying a ball and socket joint to the valve spindle and valve, for the purpose of imparting an universal motion to the spindle in order to enable it to accommodate itself to the curvilinear motion of the cover which works on centres at one end, thereby obviating the inconvenience arising from the defective action of the ordinary joint in certain positions of the spindle."

[Printed, 6d. Drawing.]

A.D. 1862, October 11.—N^o 2741.

SHEDLOCK, JAMES JOHN.—"Improvements in gas meters." These are, "the combined arrangement of the drum or measuring wheel surrounded by the annular ring or air-tight vessel with

“ the rectangular frame and covered gasholder.” “ The application of a separate float to regulate the inlet valve in connection with a floating drum or measuring wheel,” and the “ arrangement of the valve and valve boxes, and the method of obtaining the required water level,” as follows. The drum or measuring wheel is surrounded with an annular float sufficiently large to displace a volume of water equal in weight to the drum. “ The two ends of the shaft or axis of the drum pass through and are guided by a rectangular frame or double lever, which is supported and carried by two fixed pivots or bearings forming the fulcrum. Upon one end of the lever or frame is secured a curved gas holder, which is intended to neutralize the sudden entrance of gas at a high pressure into the drum or measuring wheel. Upon the other end of the frame is attached a weight equal to the weight of the curved gas holder, and which has for its object to balance the frame or lever. The frame is curved so as to allow the spout or supply pipe to pass into the drum. The gas entering the meter passes through the inlet valve, which is attached to and acted upon by a small float resting upon and governed by the water in the case ; the gas then passes through a second valve, which, being suspended, is acted upon solely by the position of the meter.” “ The gas, after passing the two valves, enters a chamber, into which the supply pipes to the drum or measuring wheel and the curved gas holder are inserted.” The “ shaft or axis of the drum or measuring wheel is fitted with a worm, by which means motion is carried to the index or registering apparatus through a long-toothed pinion fixed to a spindle placed at right angles with the shaft or axis of the drum ; provision is made on the long pinion attached to the index spindle for the arc described by the worm attached to the axis of the drum, by cutting the teeth of the pinion of the same radius as that caused by the drum rising and falling ; thus the worm presses equally and directly on the teeth of the pinion. Motion is thus carried into the registering apparatus which is of the ordinary kind.”

[Printed, 10d. Drawings.]

A.D. 1862, October 14.—N^o 2770.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Louis Bricout, Julien Bricout, and Emile Berlet.*)—“ Improvements

" in apparatus for carburetting gas." This apparatus " may be " divided into three parts, consisting, first, of a vessel or reservoir " for containing the carburetting liquid," which is placed above; second, " of the carburator proper fed by the first-named vessel; " and third, of certain valve and tap arrangements " between the reservoir and the carburator. The reservoir is supplied with carburetting liquid as required, by a portable reservoir put in communication with an aperture at top which can be hermetically closed by a stopper, &c. The reservoir communicates at bottom with the carburator by a tube, the mouth of which is covered by metallic cloth; an air tube leads from the upper part of the carburator " to near the top of the reservoir, but when the reservoir " is not attached to the carburator the air tube is replaced by a " gas pipe." The carburator is supplied with liquid from the reservoir by means of the valve arrangement, which is composed of three principal parts, a tube, a tap, and a valve. It is divided by partitions into three compartments, each of which forms a small vessel, the depth varying according to the size of the apparatus. These vessels are filled with cotton wicks extending vertically the whole depth, or nearly so, of the apparatus. In the two upper compartments the level of the liquid is regulated by two small tubes. At the bottom of the carburator is a safety compartment which receives by a tube any excess of liquid. The gas is passed by pipes to the lower part of the carburator, and after having traversed the three compartments, fitted with wicks, in a zig-zag direction, issues from the apparatus by another pipe. The metal reservoir may be replaced by a glass vessel fitted with tubes or necks at top and bottom.

[Printed, *sd.* Drawing.]

A.D. 1862, October 22.—N° 2846.

KROMSCHROEDER, HENRY HERMAN, and KROMSCHROEDER, JOHN FREDERICK GUSTAV. — "Improvements in the " manufacture of gas meters, and in the manufacture of sheet " metal suitable for gas meters." These are, first, the measuring drum of a gas meter is formed of two concentric cylinders, the space between which " is divided into four measuring compartments, but this is not essential." Each partition from the point where it is connected with the inner cylinder proceeds outwards from it in a straight line, and if prolonged it would pass

through a small portion of the inner cylinder. After proceeding in this direction for about two-thirds the distance, the partition descends in a straight line until it joins the outer cylinder. "The water line in the meter is somewhat below the upper part of the inner cylinder, and gas is admitted above the water line into the interior of the inner cylinder." A passage is formed through the inner cylinder into each measuring compartment, and such openings are immediately below the points where the partitions join the inner cylinder. In the outer cylinder there is an outlet passage formed above each partition for the passage of the gas out of the compartments when the lowest end of the compartment comes above the water line in the meter. Interior of the central cylinder there is applied or formed a float to support or buoy up the measuring drum, but to which separately no claim is made."

Second, "Manufacturing sheet metal peculiarly suitable for gas meters, and in constructing the cases and the measuring drums of gas meters of such sheet metal." The metal referred to is an alloy consisting, as near as may be, of about 16 parts by weight of copper and $1\frac{1}{4}$ ths part of tin, cast in the form of ingots, which are rolled in the same direction into sheets. The metal is annealed from time to time during rolling. The sheets are "coated with tin or a suitable alloy of tin."

[Printed, 10d. Drawing.]

A.D. 1862, October 23.—N^o 2851.

STROUD, JOHN THOMAS.—"Improvements in lamps for general and special purposes and in parts connected with the same." These improvements relate principally to oil lamps; in reference to this subject they are as follows:—First, a pendant hall lamp, the lower glass or shade of which is fitted to a brass rim or bevel, which is connected with a corresponding joint to the metal rim of the top part, and by attaching a chain at the opposite side and passing it up through a hollow tube from the metal rim up to the suspending bracket, and branching off at the top, and descending for the purpose of receiving a weight; in lighting or extinguishing such lamps, the lower shade has to be obliquely pulled down, by which the weight is elevated; to restore the shade to its place it is slightly elevated by the hand. The interior of the bracket of this lamp is a tube, and through which gas may be brought to

a suitable burner. Second, a lantern constructed for burning gas. The gas is carried down the side by a pipe nearly to the bottom, and is brought into the centre by a branch pipe; "the manner of lighting and extinguishing such lamps is by fixing a metal rim to radial axes," at the bottom of the lamp, "within which metal ring a plain or concave glass may be fixed, and which has only to be moved into a slanting position." To these lamps vertical prisms are applied in the following manner:—Holes are drilled through the top and bottom of the prisms in the right position to allow pins to project through radially from the top and bottom rims, or for pins to be inserted with ornamented heads, which pass through the prisms and screw into the rims.

Third, "means by which pendant gas lights shall receive a swinging universal motion or action without the use of the ball and socket principle now commonly used." This is effected by maintaining "an open gas way, by using two rings, the upper one attached to the ceiling plate, and the lower one to the main tube," supplying the gas to the burner, "and from the periphery of the top ring and the upper periphery of the lower ring two short bits of tube are applied," on to which is secured a short piece of tube of india-rubber or other suitable flexible material, but which admits of being made of various shapes, such as a hollow ball or otherwise, provided freedom is left for the passage of the gas. "Instead of using the india-rubber ball, a short piece of tube may be used, but the first arrangement is preferred," but in both instances the ends of the tubes or the tubular projections, top and bottom of the hollow india-rubber ball, is secured "to the metal tube of each ring by a ligature of thread or otherwise."

[Printed, 1s. Drawing.]

A.D. 1862, October 24.—N° 2869.

STROUD, JOHN THOMAS.—(*Provisional protection not allowed.*)—"Improvements in the manufacture of and in the machinery and appliances for holding, drilling, turning, tapping, fitting, and shaping certain parts of steam, water, gas, and lamp fittings." These are, first, "a machine for turning, drilling, and tapping the outside of unions, cocks, and other such like parts," consisting of a disc for holding the dies which are made

to advance and retire by means of excentrics brought into action by cams during the time of tapping the work, the tool being made to move backward and forward, also by self-acting means on a sliding bed in unison with the expanding and contracting apparatus connected with the chuck, the motion being imparted by a band or otherwise. A modification of this is described.

Second. An entire duplex machine by which at one setting of the work, simultaneously four distinct tools are put in motion, and advance or retire from the work in the order in which they are required. The work is set "in a sliding universal holder, and "the tools set for performing the operation of turning and "drilling by being brought into action by a self-acting motion, "which when done allows the tool to recede from the work, "at which moment the rest holding the work will be carried "forward (also by a self-acting motion) so as to bring the work "in position to be tapped inside and out simultaneously."

Third, a machine for clearing out the parts of fittings also for tapping on the outside of such parts required to be tapped; it is self acting, so far as the progress of the action of the drill and following up of the tap is concerned; it is necessary that the process of tapping should be regulated according to the thread required, and this is effected by means of a counter die brought into contact with the tapped portion of the main spindle or otherwise, the spindle being tapped with different threads as required.

Fourth, a machine for drilling, tapping, and turning; the drill and tap working "at distinct and separate speeds on separate "spindles, both being provided with independent motions derived "from lateral cams working on a back shaft to advance the tools "to the work which is held by adjustable jaws," &c.

Fifth, a machine with reciprocating spindle deriving its motion from an eccentric or crank on the driving or other auxiliary shaft, the eccentric gives motion to an arm which works up and down two other arms fixed upon back centres and connected together by loose joints to a connecting piece, so as to work guts or suitable straps fastened first to the ends of the top and bottom arms and passing right and left around the spindle, on which, by preference, is a spiral groove. The same object is effected by a shifting band working over two driving pulleys, the one pulling a bevelled wheel fixed on its spindle, and the other a bevelled wheel fixed to the pulley.

Sixth, an apparatus for "centring and drilling the various kinds of work to be subsequently operated upon," by means of a rest fixed in front of the revolving tool, fitted with two or more radial adjustable bolts set and held in position by set screws, and against these bolts the work to be operated on is placed and held up by a back centre, which presses the work with the holder up to the tool by means of a lever worked by the operator. As a modification of this arrangement the rest is formed with two side supports fitting through holes formed in the sides of the upright supports, with helical springs to pass over them to force back the rest after being advanced. A large hole is turned in the rest in which are plugs for holding the articles.

Seventh, a machine or apparatus for upright drilling, consisting of a vertical spindle (with a drill) held in collars attached to a vertical standard, which standard affords the fulcrum for a lever which is connected to the upper end of this spindle. A regulating screw is applied to the lever to regulate the amount of depression to be given to the spindle. Below the drill is a bed, supporting at the back a regulating centre, and in the front, jaws are fixed to a slide.

Eighth, an apparatus for holding gas, &c. fittings, when cutting certain parts, such as the squares of a swing plug or the sides of a screw head or nut. The apparatus has an advancing and returning motion in the direction of the revolving spindle as well as at right angles to it.

Ninth, an arrangement for turning articles of an irregular shape, such as connecting cocks, bracket backs, and such like articles, consisting of a suitable bed spindle and pulley for giving motion to the work, and a chuck for holding the same in a peculiar manner.

Tenth, a machine for turning articles on the outside, consisting of a spindle and pulley for giving motion to the work fixed upon a suitable bed. Motion is given to the work by means of a worm or its equivalent.

Eleventh, shaping or forming the periphery of pulley wheels for sustaining the balance weights of chandeliers and other purposes. By using rings of a necessary width and by means of pressing apparatus indenting them or shaping them as desired.

Twelfth, taking a union that has been tapped on the inside, *by the apparatus* herein-before referred to, and screwing it on to a taper-topped plug fitted on to the mandrel of an ordinary lathe

worked by steam or otherwise; thus the union is held centrally for the advancement of the tools by which it is turned over its outer surface, &c.

Thirteenth, "brightening and cleaning of surfaces of gas tubes, &c. by a hollow chuck with a sufficient number of what "are technically called scratch nobs," applied radially towards the centre, the chuck is passed through when the chuck is put in motion.

[Printed, 6d. No Drawings.]

A.D. 1862, October 25.—N° 2877.

CLARK, WILLIAM. — (*A communication from Richard Chester Robbins, Jesse Moore Kean, and Henry Lamson Case.*)—"An improvement in the construction of the joints of cast-iron gas and water mains and other pipes." This consists in "making such joints by forming grooves or recesses around the interiors of the sockets or larger ends of the pipes, making the smaller ends slightly taper, casting rings of lead or other soft metal or alloy within the aforesaid grooves or recesses before putting the pipes in the ground or into the places they are to occupy, and afterward drawing or forcing the taper smaller ends tightly into the aforesaid rings." The sockets are cast like those of the cast-iron street mains in common use, only near the mouth, around its interior is a recess for the reception of a lead ring and that portion of the interior is not quite so large. The smaller ends of the pipes are made as true and smooth as possible by being cast in a ring of cast-iron "which has been bored out perfectly true and smooth." "Any suitable apparatus may be employed to force the smaller ends of the pipes into the sockets." An apparatus is used consisting of two half rings which are placed behind the socket of the joint to be made and eyes or loops formed on two long rods are applied "which keep the half hoops together, the other ends of the rods have screws and nuts jointed to the end of the pipe to be forced into the socket. A bar stretched across the end of the pipe receives the pressure of the nuts and strain exerted to force the joint home."

[Printed, 8d. Drawing.]

A.D. 1862, October 30.—N° 2925.

LOCKWOOD, JOHN. — (*Provisional protection only.*)—Improvements in boiler furnaces.

"These improvements consist in placing fire-clay or metal of cylindrical or other suitable form behind the bridge in the flues of Cornish or other boilers, which reduce the area so as to cause the flames to circulate or pass on all sides thereof, and impinge more keenly on the heating surfaces, whereby steam will be generated more rapidly, and fuel economized, and the great heat imparted to the fire-clay or metal will ignite the combustible gases as they pass from the furnace, and thereby prevent or consume the smoke. Such apparatus, being made hollow with suitable arrangements, may also be employed for the generation of illuminating gas."

[Printed, 4d. No Drawings.]

A.D. 1862, October 30.—N^o 2929.

EATON, JOHN.—(*Provisional protection only.*)—"An improvement or improvements in the manufacture of certain kinds of gas burners for illuminating purposes." This consists in making argand or "such other burners for illuminating purposes as have an annular figure," from small iron tubing by bending a piece of iron tubing into the form of a ring, and joining the ends together by brazing. The ring is "supported by the pipe conveying the gas, which pipe is brazed to the ring either at the point where the ends of the tubes are joined, or at any other part. On the upper side of the tubular ring holes of the requisite size are drilled for the passage of the gas." The small iron tubing employed "may either be of a cylindrical figure or flattened; glass chimneys or globes of the ordinary kinds are employed with gas burners" made according to this invention.

[Printed, 4d. No Drawings.]

A.D. 1862, October 30.—N^o 2930.

PIGGOTT, GEORGE.—"New or improved machinery for punching, shearing, and rivetting sheets or plates of iron and other metals and alloys." This consists, first, in a punching machine, the bed of which has slides on which the table carrying the plate to be punched performs first a longitudinal motion and afterwards a transverse motion. The longitudinal motion is effected by a screw on which a toothed wheel works, which carries a ratchet wheel on each side and is made by a sliding motion to

gear with palls carried by one or other of two face plates between which it is situated, a reciprocating motion being given to the toothed wheel. The transverse motion is thus effected:—A shaft at right angles to the before-described screw carries at its end a disk, on one half of the periphery of which two threads of a screw are cut. "On the under side of the table is a rack in which the said screw engages. As the said disk rotates the screw threads carried on one half of it engage in the rack at each semi-revolution, and advance the rack and table, while during the other semi-revolution the plain part of the disk is presented to the rack, and the said rack is not moved." The longitudinal punching is effected by two punches opposite to each other on the longer sides of the machine, and the transverse punching is effected by one of these punches and a third punch placed at the extremity of the machine. The punches are worked by levers actuated by cranks, and the means by which the screw moving the table longitudinally is worked is described.

Second, in a shearing machine "constructed to shear one side and one end of a metallic plate either at the same time or at two separate cuts." In this machine employing a fixed and moveable cutter, both of which are bent in or nearly in the middle at right angles. "The working edge of the fixed cutter is in a horizontal plane, but the edge of the moveable cutter is inclined to the horizon. The extremities of the moveable cutter are lower than the angular part." When the cutting of two sides of the plate is performed at two operations, a cutter of the ordinary kind is employed, and the plate to be sheared is moved on a table through quadrants or other portions of a circle. "After the shearing of one edge the table is turned so as to bring the other edge at right angles to that already cut."

Third, in "a machine for rivetting together sheets or plates curved to the segment of a circle," and is also "adapted to rivet plain plates." The rivetting punch is driven by a cam on the driving shaft of the machine, and a second cam on the same shaft works a guide which enters "two opposed holes in the plates," while the rivetting is effected in other holes. The guide slides in a tube, the end of which bears against the plates while the guide is being withdrawn from the holes. The die against which the rivetting is effected is supported by a wedge capable of being raised or lowered. The plates are carried by apparatus between the rivetting tools which give only a rectilinear

motion to the table carrying the plates; "a curvilinear motion" is given to them when required by means of a guide of angle "iron having the required curvature. The guide is fixed on the bed of the machine, and by means of guide rollers the table is made to follow the curvature of the said guide." This machinery it is said is applicable to the manufacture of, among other things named, gas holders.

[Printed, 2s. Drawings.]

A.D. 1862, October 31.—N^o 2937.

BOWDITCH, WILLIAM RENWICK.—"Improvements in carburetting or naphthalizing gas, and in the apparatus employed therein." These are, "applying heat to vaporize and keep vaporous the hydrocarbons employed for carburetting or naphthalizing gas for illumination and in passing gas before it is burnt through or over the heated hydrocarbons." The heat which it is preferred "to use for this purpose is that produced by the same gas which is used with the vaporized hydrocarbons for illumination, as this costs nothing." The apparatus employed for the above purpose consists essentially "of a gas-tight vessel to hold the hydrocarbons, which vessel is connected by a pipe or pipes with a burner or burners to consume the carburetted gas. The hydrocarbon vessel is supplied through an aperture which is closed gas-tight except during the filling. The carburetting apparatus is also connected by a pipe with the pipes supplying gas, and is so arranged that heat produced by combustion of the carburetted gas or otherwise is caused to act upon the hydrocarbon vessel and also upon the pipe or pipes conveying the carburetted gas to the burners, so that the gas and hydrocarbon vapours pass hot to the burners for consumption. The amount of heat communicated by the burning gas to the hydrocarbon vessel can be regulated by altering the distance between it and the burning gas." By this process and apparatus "light giving materials, such as naphthalin and the heavier coal oils which have hitherto been comparatively worthless," can be used "to produce cheaply a very brilliant light." It is preferred to use "hydrocarbons which have about the same density as water, and to dissolve in them as much naphthalin as they will retain in solution at ordinary temperatures."

[Printed, 8d. Drawing.]

A.D. 1862, November 1.—N° 2961.

WINTER, JAMES, the younger.—“An improved safety tap or cock applicable to gas burners, gas pipes, and vessels containing gas, also water pipes, steam pipes, and vessels containing inflammable and other liquids, compressed air, and spirituous liquors.” This “is designed for rendering taps or cocks more secure against being accidentally opened or partially turned round,” and is as follows:—Through a square or other shaped piece of metal two taper holes are formed, in one of which is fitted an ordinary plug or tap, and in the other hole is fitted “a plug or valve somewhat similar to an ordinary plug, but differing therefrom by making the outer end thereof or handle round, instead of flat, and milling the edge thereof, so that in order to turn this valve round in its seat, the milled part must be firmly gripped by the fingers. There is a spring attached to the valve for turning the same in its seat, and a spring bolt for holding the valve open, said bolt being acted upon by the ordinary tap aforesaid.” “The essential feature of this invention consists in connecting the ordinary tap before mentioned with the valve aforesaid,” or “in causing the tap when shut off to act upon the valve, thereby withdrawing the bolt” and allowing “the spring to turn the valve in its seat, and shut the passage through the same, so that in the event of the tap aforesaid being accidentally turned round the valve aforesaid will remain closed until it is turned round by hand as above stated.” The mode of carrying out the above may be varied.

[Printed, 10d. Drawing.]

A.D. 1862, November 3.—N° 2966.

TRACHSEL, FREDERICK, and CLAYTON, THOMAS.—“Improvements in machinery or apparatus for obtaining light, heat, and ventilation, parts of which improvements are also applicable to other purposes.” First, in No. 652, A.D. 1861, is an ordinary still in an open water bath and “heated by a fire from below or by a steam pipe;” the improvement is “the introduction of a current of air or gas into the liquid of the inner vessel, whereby the evaporation of the fluids undergoing distillation is so hastened and modified as to produce new results.”

Second, the application of an outer casing to "generators or
" generating boxes where the gas is produced ; this outer casing
" is of wood or metal, and has an opening on each side for the
" admission of a main air pipe of metal," inside of which is
" placed "the gas pipe or tube conveying the gas to the burners."
On the outer generator case is placed "another tube or pipe to
" convey the air to the bellows underneath the carriage; this
" completes the connection and enables a circulation of modified
" air to be drawn by the aspirating power of the bellows through
" the lamps and generator case into the reservoir for air."

Third, "in the use of a supply box or regulator for the admis-
" sion of the gas liquors into the generator," screwed on the
generator by "a perforated brass or copper screw plug, and
" having a small conical valve in the perforation to regulate by
" means of a fine screw the admission of the liquor." The tail
of this screw "passes through a stuffing box at the top of the
" reserve regulating box, and has a pointer or index with stops
" at proper intervals."

Fourth, in applying gas for lighting railway carriages, supplying
" the required current of air by means of the motion of the axle
" of the carriage." The apparatus "consists of and depends
" upon the action of a slack strap, rope, or chain, or friction
" pulley working upon the carriage axle, either of which, when
" stretched by a falling roller, actuates a pulley mounted upon a
" shaft carrying a pinion, which gears into a larger toothed wheel,
" on the axis of which is a crank or eccentric," which works "by
" means of a connecting rod, a small pair of bellows, or several
" pairs if required, from whence air is driven into a larger holder
" or bellows to serve as a reservoir for air." "On the top of the
" air reservoir a lever is so jointed as to depress a roller on to the
" slack strap, chain, or rope, whenever the air reservoir is short
" of air." "A friction break is also employed to act in an oppo-
" site direction to the falling roller, and connected to the same
" lever." Upon the shaft of the crank before mentioned "there
" is a toothed wheel gearing into another toothed wheel on a
" second shaft, in order to diminish the speed; the second shaft
" terminates in a square near the side of the carriage, so that it
" may be turned by a handle, and work the bellows when the
" carriage is stationary."

Fifth, for "obtaining a current of air for the said gas for
" stationary purposes, or on board of a ship," employing "a

" machine consisting of a barrel or roller, upon which a rope, chain, or band, is wound, as in a clock, a weight at the other end of the rope giving the requisite power, or a spring may be used inside the barrel;" to gain more time and space for the weight using "a small pair of pulley blocks, one of which is fixed to the frame of the machine, and the other block to the weight, using only the loose end of the rope on the barrel, on the shaft of which barrel "a loose toothed wheel with a catch to fit in a ratchet wheel fixed to the drum or barrel" is placed. "The main wheel works on a short train of wheels and pinions." A machine similar to the above is used, but "with two cylinders or barrels of different diameters, and moving at the same rate by equal gearing to obtain a differential action" and dispense with pulley blocks.

Sixth, a "hydraulic blower for supplying air to the said gas, constructed on the plan of a hollow drum of suitable shot metal," having "four or more compartments of a helical or cylindrical form, and connected with a central tube through which air is delivered, the air being gathered by slits in the periphery, and the drum being immersed half way in water, oil, spirits of turpentine, petroleum, naphtha, or any other convenient liquid contained in the outer case of the drum. The air delivered at the centre of the drum is passed into an air-tight chamber, from whence it is conveyed to the generators."

Seventh, a "fan for supplying air to the said gas" is made by placing or forming "upon the shaft of the internal impellor or blade drum an endless screw with an angular section, or as it called V-screw, and consisting of two threads or of a greater number of threads; this endless screw receives a rotary motion by means of a sharp toothed spur wheel."

Eighth, a "reflector, moveable cap, and wind vane for carriage and other lamps when the said gas is used." The reflector is of a ceramic material having a metallic glaze; the "transparent glaze, and the body of the reflector is one solid mass."

Ninth, in "obtaining heat and ventilation from the said gas," employing "a generator for gas, and an air machine as before described. The heated air is passed through a moist porous substance to render it healthful and beneficial."

Tenth, using "the air and gas apparatus herein-before described to supply several burners under the vessels employed in cooking food or treating substances for that purpose."

[Printed, 1s. Drawing.]

A.D. 1862, November 10.—N° 3027.

LAVOINE, JEAN BAPTISTE.—“A kitchen range adapted for “cooking, warming the apartments, and generating gas for the “use of private families, hotels, or gentlemen’s country seats.” These are, in reference to this subject, in a kitchen range having a retort or retorts for generating gas placed in a gas furnace, below which is a dusthole containing water to keep the air in an hygro-metric state, on the top of the retort is a pipe to conduct the gas, tar, and ammoniacal waters from the retort to the condensers; from this it passes over plates containing lime, and from them to the gasometer.

[Printed, 1s. 4d. Drawings.]

A.D. 1862, November 11.—N° 3041.

MARRIOTT, EDWARD, and HOLROYD, SAMUEL.—“Improvements in the purification of gas and in obtaining “certain useful products therefrom.” These are first, “the “combined use of sulphate or other salt of iron and ammonia, “or other alkali or alkaline salt.” To a solution of the salt of iron, alkali is added until the solution has a decided alkaline reaction. This is pumped through “the ordinary gas scrubbers, “but as the iron will become decomposed during the process “of purification, small quantities must from time to time be “added.”

Second, “the use of sulphide or sulphuret of iron.” The sulphide or sulphuret is derived from other sources than the above for “purifying gas, either in the wet or the dry way.” If in the former the sulphide obtained by any usual process in a fine state of division is suspended in water while through this mixture the gas is passed by any convenient arrangement of pipes. For the dry way the sulphide or sulphuret of iron is mixed with saw dust, coke, &c., so as to form “a porous mass “through which the gas may be passed.” The sulphide of iron is obtained by treating lime used in purifying gas with a solution of sulphate of iron, applying “the solution of sulphate of iron by “sprinkling only, or other moderate use, so as to prevent the lime “from becoming too pasty.”

Third, in carrying out the first part of the invention, obtaining “as bye products sulphate of ammonia, compounds of cyanogen, “and sulphide of iron, which may be used for manure, for ob-
“taining sulphur, or for other ordinary purposes.”

[Printed, 4d. No Drawings.]

A.D. 1862, November 14.—N^o 3066.

CATHELS, EDMUND SMALL.—“Improvements in apparatus “used in the manufacture of gas.” These are, first, in an exhauster there are two axles, each having four or more radiating arms or blades of suitable shape fixed thereto, and fitted into a case. The axles are connected at one or both ends to cogged wheels or pinions placed in a box attached to the side or sides of the case in which the arms revolve. These arms or blades are so shaped and placed so that when they are at rest they stop the passages of the gas. “Motion is imparted to the axles and radial “arms or blades by means of a driving rigger or pulley fixed on “the end of the lower axle which passes through a stuffing box “out of the box containing the pinions.” “An oblong opening “on each side of the case serves as the inlet and outlet respectively.” Should the exhauster suddenly cease to act a by-pass is provided as follows:—“Both the inlet and outlet connections “have on their upper sides ports or holes (in which an open “grating is fixed) that open into a pipe or communication that “passes over the outside of the upper semicircular end of the “case,” and a valve is fixed over the grating on the inlet side of the exhauster, “such valve being weighted if required so as to “keep closed while the exhauster is in action.”

Second, “a by-pass valve in connection with the exhauster:”—An oblong box is divided vertically into two parts, placed parallel with the inlet line of piping, but the partition does not extend quite to either the top or bottom of the box. There is an outlet port in each of the sides of the box at right angles to the partition, and both above and below these ports a narrow horizontal ledge projects from the inside of the sides of the chamber on each side of the partition. A disc, in preference, of wood, strengthened by the addition of a metal plate, “is made to shut, “up and down gas-tight on these projecting ledges; the one “plate being raised so as to press against the upper ledge on “one side of the partition, while the other plate is simultaneously “pushed down against the lower ledge on the other side of the “partition by means of spindles” connected to the discs, passing out through the top lid and stuffing boxes, and to each of which rods or spindles there is a rack attached, the teeth or cogs of both racks projecting inwards, and between which there is fixed a vertical toothed pinion, the teeth of which gears into the teeth

or cogs in both racks. Or a horizontal drum with a spiral thread around its circumference of the same pitch as the teeth of the rack may be employed. "The turning of such pinion or screw " simultaneously raises the one disc and depresses the other." Other means are described for actuating the discs. And a modification of the above valve is likewise given.

[Printed, 10*d.* Drawings.]

A.D. 1862, November 17.—N° 3085.

BINKS, CHRISTOPHER.—(*Provisional protection only.*)—"Im-
proved methods of obtaining oxygen and chlorine gases." These are, in reference to this subject, first, bringing into contact with water or steam strongly heated chlorine; oxygen gas is liberated and hydrochloric acid is formed. "Substances capable of absorbing or combining with the hydrochloric acid formed," are added.

Second, applying heated dry chlorine to the manganese or other oxides at ordinary temperatures or otherwise, a chloride of the metal is formed and the previously combined oxygen is liberated in the form of gas. The chloride of manganese may be applied to useful purposes or treated for its recovery as described in No. 1240, A.D. 1861.

[Printed, 4*d.* No Drawings.]

A.D. 1862, November 18.—N° 3093.

ARBÔS, JACQUES.—Improvements in producing gas for lighting and heating.

"The apparatus consists of a furnace lined with fire-brick, and, by preference, in the shape of a fan-inverted cone, with a circular grate at bottom through which air supplied by a blast is admitted from a pipe below, its admission being regulated by a tap. There is a conical vessel with opening at top placed on the mouth of the furnace, through which coal or other fuel is introduced, and by which gas is allowed to escape at the commencement of the operation. As soon as inflammable gas is produced, the opening is closed by a conical stopper. A syphon tube passes into the furnace, through which tar, oils of resin, of schist, of petroleum, or liquified fatty matters, are introduced when required. The gas generated in the furnace " passes off by a tube from the upper part of the furnace into

“ ordinary retorts, in which coal or resin oil gas is being generated. From these retorts the gaseous mixture passes through the condensers and purifiers to the gas holders.”

[Printed, *ed.* Drawing.]

A.D. 1862, November 18.—N° 3099.

BROWN, ROBERT.—“ Improvements in warming and ventilating, more especially applicable to buildings, carriages, and ships.” The ventilation is effected by the heat of a gas burner or other light. “The light is supported by the vitiated air of the room or other confined space. Supposing that I desire to ventilate an apartment, a tube from the upper part of the room conducts the vitiated atmosphere down to the light, which may be placed at any part of the chamber. The impurities of the atmosphere are thus consumed on passing through the flame, the products of combustion being carried off into the open air by a confined tube issuing above the flame and traversing the building in any direction to some outer wall. By employing a second tube within the mouth of the exit tube at the point where it meets the outside air, and allowing this second tube to open into the apartment I can supply warm fresh air to the room, the cold air within the second tube being surrounded by the heated air passing out is thereby heated, and issues into the room warm and fresh.”

[Printed, *10d.* Drawing.]

A.D. 1862, November 22.—N° 3147.

WEBSTER, JAMES.—“ Improvements in the construction of burners and blow pipes.” These are, in reference to this subject, as follows:—First, a gas burner is made circular, but instead of causing the gas to issue from a circular series of holes as in the ordinary argand gas burners, in preference, the burner is constructed, as in argand wick lamps, with an annular space for the passage of the gas; and in order to modify its exit from the burner this annular space is filled with vertical wires between which the (carburetted?) hydrogen will pass to the exit aperture.” An oxygen gas tube “is placed in the centre of the burners before, and as the gas issues from its tube it impinges against a horizontal disc placed at the top of a spindle, and is thereby deflected or directed into the flame of ignited hydrogen. An oxy-hydrogen

" blow pipe is constructed somewhat upon the same principle," only the oxygen tube is notched or indented at its outer extremity, and a nozzle is screwed on to the outer tube.

Second, " a novel form of adjustable stop cock for regulating " the supply of both gases." The two gases are made to pass through separate openings or passages made in the same cock, and these passages are properly proportioned to each other, so that on turning the cock the two gases are turned on in the required proportions.

Various modes of constructing these passages may be devised. One mode found convenient " for the oxygen gas passage " is " to form partly round the cock a groove of gradually increasing " width and depth, so as to enlarge the aperture for the passage " of the oxygen as the passage for the hydrogen is more or " less opened. An adjusting screw for more or less closing " the hydrogen passage is also adapted to the burner." " This " adjustable stop cock is applicable to the burner and blow " pipe."

[Printed, 10d. Drawing.]

A.D. 1862, November 27.—N^o 3178.

HARTLEY, FREDERIC WILLIAM. — (*A communication from George Hawitz.*) — (*Provisional protection only.*) — " Improved " means of obtaining certain products resulting from the manu- " facture and purification of coal gas." Oxide of iron " in the " form of ore or otherwise " is roughly ground and mixed in proper proportions with sawdust or old tan, but tan is used by preference; the mixture is then placed in the purifiers on wooden trays. " After so much gas has been passed through the oxide " that it ceases to purify, atmospheric air must be blown through " the purifiers, by which process the iron becomes reoxi- " dized." " The air thus blown through the purifiers takes up a " large portion of ammonia and carbonate of ammonia during " its passage; this can be collected by suitable known means by " bringing it in contact with sulphuric acid. The material thus " reoxidized can be used over and over again without removal " from the purifiers until (by the accumulation of tar and of " sulphate of ammonia which the air will not act upon) the " oxygen in the air ceases to have any effect upon the iron." *When this is the case the material is removed and washed with*

gas water and afterwards with water if required, and after a few days exposure to the air it may be again used for purification. "The liquor from the oxide collected" is treated with sulphuric acid and evaporated. The liquor "will have lost its peculiar smell of sulphuretted hydrogen which is taken up by the hydrated oxide of iron contained in the iron ore."

[Printed, 4d. No Drawings.]

A.D. 1862, November 27.—N° 3185.

CLARK, WILLIAM. — (*A communication from Louis Joseph Frédéric Margueritte.*) — (*Provisional protection only.*) — "Improvements in gas burners." These are regulating the amount of air supplied to argand burners "exactly to that which is necessary for proper combustion" "by means of taps, valves, or other similar apparatus, self-acting or otherwise, the burner being enclosed in a chamber to which the admission of air is regulated as described."

[Printed, 4d. No Drawings.]

A.D. 1862, December 3.—N° 3245.

BROWNE, WILLIAM HENRY. — (*Provisional protection only.*) — "Improvements in gas stoves." These are arranging over a gas burner of a circular or other form, such as is now commonly employed in gas stoves, a dome either of fire-clay, or stone, or of other similar mineral material which is a bad conductor of heat. This dome covers the burner and absorbs the heat produced by the combustion of the gas, which in turn it radiates off and communicates to the air with which it is in contact. There is a hole in the top of the dome to allow the draft from the gas burner to escape upwards. The burner and dome may be enclosed in an ornamental case of metal or other material."

[Printed, 4d. No Drawings.]

A.D. 1862, December 5.—N° 3266.

COWAN, PHINEAS. — (*Provisional protection only.*) — "An improved method of purifying gas." This consists in "the employment for that purpose of animal charcoal, or of vegetable charcoal, or other form of carbon." The charcoal or carbon is placed "in purifying vessels of the ordinary or other form" into which the gas is conveyed; "from these vessels the gas is con-

" ducted, the charcoal or carbon having removed the impurities from it."

[Printed, 4d. No Drawings.]

A.D. 1862, December 12.—N^o 3334.

FOX, SAMUEL.—"Improvements in retorts and apparatus employed for the manufacture of gas, and also in purifying gas." These are, first, "the combined arrangement" of apparatus. Instead of the retorts being placed horizontally, they are placed on end each in a strong metal plate or saucer over the crown of the arch of the furnace. Six or other suitable number of small flues rise from the furnace into one circular flue which tapers somewhat towards the upper end. "At the upper portion of the conical flue or chamber are six or other suitable number of small flues branching out radially into a circular flue," in which is a division of brickwork to diverge the heat of the flues; ultimately it meets at one point and passes to the stack or chimney. To discharge the coke from the retort a strong metal disc rests at the bottom within each retort; into this an instrument is inserted and turned round becomes fixed, and on being withdrawn the disc and the coke resting upon it are withdrawn at the same time. To obtain free access to insert the instrument used in the disc, a metal cylinder is placed within the retort one end resting on the disc. The cover of the retort is fixed in the usual way; it has in it a small sight-hole to view the materials.

Second, "the employment of the turnings or filings of wrought or cast iron in the metallic state for purifying coal gas." These are "used in apparatus such as are known as dry lime purifiers." "The gas is caused to pass in contact with these turnings or filings of iron till the gas comes away" insufficiently purified, "when the turnings or filings are to be removed from the purifiers and for a time subjected to the action of the atmosphere in like manner to that which has been resorted to when using precipitated or other oxides of iron for like purposes."

[Printed, 1s. 10d. Drawings.]

A.D. 1862, December 17.—N^o 3368.

DEFRIES, COLEMAN.—"Improvements in the manufacture or construction of lamps." The object of this invention, says the patentee "is the production of a lamp, whether for streets, porticos, or other localities, in which shall be combined the

“ maximum of lighting with the minimum of cheapness.” The lamp is lighted with gas, but the invention refers only to the construction of the lamp.

Street lamps :—The gas pipe is continued above the pillar to the full height of the body of the lamp; its top is hermetically closed, and from the top radiate three or more arms for the support of an upper frame wherein are long slots. On the capital of the pillar is scroll-work for the support of the lower frame furnished with ledges or grooves; this frame is above the carburator and the stop-cock. Strips of glass, passed through the slots, rest on the ledges or in the grooves, so that the body of the lamp is glazed “ without side or vertical framing.” The cover is made either with glass (supported by an upper and a lower frame) or of metal which is sometimes silvered inside or lined with glazed earthenware to serve as a reflector. The cover rests on the upper frame, or it may be hinged thereto, when it is made with glass, its “ frames are connected by a central pipe.” The gas pipe is made into a reflector by silvering or coating it; the burners branch out from its sides.

Bracket lamps :—The gas pipe is connected with the upper frame, and part of the frame and one of the arms serve as a conduit for the gas. A pipe descends from the centre of the arms the whole length of the body, and arms from the pipe support the lower frame.

Pendent lamps :—The pipe descends through the cover (which slides on it) to the bottom of the body; it carries arms for the support of both frames.

[Printed, *8d.* Drawing.]

A.D. 1862, December 17.—N^o 3371.

THORNE, JAMES.—(*Provisional protection only.*)—“ Improve-
ments in apparatus for regulating the flow of gas to burners.”
These consist “ of a valve fixed in a metal chamber, the lower
“ part of which is attached to a supply pipe, and the upper part
“ supplied with a gas burner. The valve is formed of a hollow
“ tube having a set off at its base, which is of enlarged diameter
“ and capacity; inside this tube is another tube of smaller dia-
“ meter, having an inverted tube attached to its outer surface at
“ its upper end so as to fall over the external surface of the larger
“ tube, and rest on projections on the set-off or upper part of its

" ducted, the charcoal or carbon having removed the impurities from it."

[Printed, 4d. No Drawings.]

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Bracket lamps :—The gas pipe is connected with the upper frame, and part of the frame and one of the arms serve as a conduit for the gas. A pipe descends from the centre of the arms the whole length of the body, and arms from the pipe support the lower frame.

Pendent lamps :—The pipe descends through the cover (which slides on it) to the bottom of the body; it carries arms for the support of both frames.

[Printed, 8d. Drawing.]

A.D. 1862, December 17.—N° 3371.

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ments in apparatus for regulating the flow of gas to burners." These consist "of a valve fixed in a metal chamber, the lower
part of which is attached to a supply pipe, and the upper part
supplied with a gas burner. The valve is formed of a hollow
tube having a set off at its base, which is of enlarged diameter
and capacity; inside this tube is another tube of smaller dia-
meter, having an inverted tube attached to its outer surface at
its upper end so as to fall over the external surface of the larger
tube, and rest on projections on the set-off or upper part of its

“ base. This inner tube has a notched ring attached to the outer
 “ part of its cup, and is longer than the smallest part of the outer
 “ tube. An inverted cup of larger diameter than that which is
 “ attached to the second or inner tube is placed over this second
 “ tube rested on the notched ring, and to this larger inverted
 “ cup is attached a cup or disc of metal, or other suitable material,
 “ a little below the lower end of the second or inner tube.”
 When the pressure is low the valve in this position has its passage
 open, but “ if the pressure of the gas is more than equivalent to
 “ the weight of the large cup they are raised, and the cup or disc
 “ is pushed up against the lower end of the inner tube, thereby
 “ shutting off that communication to the burner; and on the
 “ pressure further increasing, the inner tube is raised, the cup or
 “ disc coming in contact with the under part of the set-off of the
 “ outer tube or seating of valve, the aperture through which
 “ the gas has to pass being decreased in size as the pressure in-
 “ creases and on the pressure of the gas becoming less, the parts
 which have been raised fall, and the apertures again open.”

[Printed, 4d. No Drawings.]

A.D. 1862, December 18.—N^o 3391.

LONGLAND, JOSEPH.—“ Improvements in street lamps.” In the Provisional Specification the patentee prefers a triangular or three-sided form for his lamps, but in the final specification he adopts a four-sided form. The lamp is made “ very broad at the
 “ eaves ” and diminishing to very small proportions at the bottom, so that a bottom glass is not required. Inverted reflectors are placed in the cover on a level with the cover “ or in any way above
 “ the flame ; ” they may vary in number, be set at any required angle and be made of any reflecting material ; they are protected outside with tin, zinc, copper, or other covering.

“ By these improvements the light is increased to about double
 “ its original power in the old non-reflecting lamps.”

[Printed, 6d. Drawing.]

A.D. 1862, December 23.—N^o 3427.

HASELTINE, GEORGE.—(*A communication from James Rhodes.*)
 —“ Improvements in the mode of and apparatus for converting
 “ petroleum or coal oil into gas for lighting, and heating, the said
 “ improvements, being especially applicable to lamps and stoves.”

These are as follows :—"The reservoir for holding the oil is placed " either above the burner or below, as found most desirable." When the oil is placed below, an elastic diaphragm is employed operated by a spring "to force the oil up from the reservoir or " body of the lamp through a tube at its upper end, where the " same is formed into vapour." In an aperture at or near this end of the tube a needle valve is placed "operated by means of a rod " or spindle passing through the said tube and terminating in a " handle for rotating the said rod at a convenient distance from " the burner. The point of the needle valve operates in and " through the aperture in the tube, preventing the aperture from " being clogged." "Moving this valve backward and forward " opens and closes the aperture, and thereby regulates the " flow of the vapour." "To secure perfectly combustible gas " a liberal amount of atmospheric air must be mingled with " the vapour before the same comes to the flame. This gas is " made, when the apparatus is applied to a lamp, either in a " chamber above the flame, where it is exposed to a high degree " of heat, and from which chamber it descends to the burner in " quantities sufficient to feed the flame, or the vapour may be " mingled with the air before the vapour reaches the said chamber, " and after being sufficiently heated the gas descends to the " burner." "When these improvements are applied to a burner " for heating, the vapour passing out of the tube comes in contact with a heated cap containing rows of apertures on its edge, " the central portion being unbroken. Thus sufficient air becomes " mixed with the vapour to change the same into perfectly combustible gas. The gas is ignited as it passes up through the " apertures in the cap, for the purpose of cooking or heating. " This cap is placed directly over the needle valve in the supply tube, and becomes sufficiently heated by the ignited gas to convert the oil in this tube into vapor, the same result being also " attained in the use of a lamp by the heat of the burning gas. " The vaporization of the oil is first effected by heating the upper " end of the supply tube by means of burning spirits or other " light " in a cup surrounding it.

[Printed, Ed. Drawing.]

A.D. 1862, December 29.—N^o 3462.

RIDDELL, JOSEPH HADLEY.—"Improvements in cast-metal " or other pipes or tubes for conveying gases, fluids or vapours,

"and in the mode of connecting such pipes or tubes." These are, "forming a groove or recess in the face of the flange, the sectional form of which groove may be either the segment of a circle or any other convenient shape;" and, by preference, forming "this groove or recess in the face of the flange in the space between the internal orifice or bore of the pipe and the holes cast or made in the flange through which the bolts or screws pass, which are used in connecting the different lengths or pieces of pipe together. These grooves or recesses being formed upon the face of each flange must be arranged to meet or correspond with each other when brought together, forming a grooved channel round the face of each flange," and in connecting these pipes together placing "a ring of india-rubber, hemp, or other suitable and elastic material in this groove," and drawing "the flanges together by bolts and nuts or screws, thereby compressing the elastic ring or packing and forming a joint impervious to gas, water, or steam." It is stated that "india-rubber prepared or vulcanized has already been commonly used for making joints or flange pipes, but it has been formed of flat rings of the material pressed between the flat faces of the flanges," but these improvements consist "in forming cylindrical or other rings of the packing material which fit and are compressed into grooves or recesses formed in the face of each flange, thereby removing the objection which has frequently been raised to this mode of making joints, that the india-rubber is gradually forced out between the plain flanges of the pipes by the pressure of the steam or water in the pipes."

[Printed, 8d. Drawing.]

1863.

A.D. 1863, January 6.—N^o 44.

LEIGH, JOHN.—"Improvements in the treatment of gas produced by the distillation of coal, cannel, bituminous shale, boghead mineral, oils, petroleum, or other combustible substances, and for the obtaining of certain products therefrom." *These are subjecting gas obtained as above to the action of nitric*

acid or a mixture of nitric and sulphuric acids. This is best effected in "a series of earthenware vessels of the form and "arranged in the manner of Woulfe's bottles. The gas is passed "through the acid so to remove its benzole from it, as nitro-benzole when the operation is completed, removing the "nitro-benzole and other products separating themselves from the acid "liquid, and which acid liquid may be employed after the removal "of the products above-mentioned, for purposes where weak "nitric and oxalic acids may be required, containing, as it does, "a considerable quantity of the latter acid; or the oxalic acid "may be separated therefrom by well-known methods." "Where "a mixture of commercial nitric and commercial rectified sulphuric acid is employed," in preference, using "one part of "nitric acid to two parts of sulphuric acid; and when fuming "nitric acid is used," in preference, using the strongest.

[Printed, 4d. No Drawings.]

A.D. 1863, January 13.—N° 105.

STROUD, JOHN THOMAS.—"Certain improvements in fixed "and portable lights for domestic and other uses, applicable for "burning gas and the mineral oils or spirits now so commonly "used." These are, in reference to this subject, first, "supporting between the arms the part for holding the burner and glass "shades in contradistinction to fixing the supports for carrying "the glass shades, chimney, gallery, &c. on the ends of the arms, "thereby cumbering the light with its obstruction and consequent downward shadow."

Second, "conveying the gas to a ring in which a certain number of circular or other formed openings or bearings are made "for receiving the glass shades."

Third, connecting "the ring for holding the aforesaid glasses "to the body of the chandelier or other suitable part of it, or by "only inserting the cock or tap between them."

Fourth, "constructing gas chandeliers that while the principal "lights are fixed or made to slide when desirable, the one centre "light shall be fitted with an independent slide, so constructed "as to admit of being considerably lowered from the other lights, "thus possessing the quality to permit being pulled down for "lighting a table that may be placed beneath it, or other desirable "purpose for which an increased or near light may be required."

Fifth, "constructing a single gas pendent light, that the same
 " may be raised and lowered with weights as a counterpoise, and
 " a water slide so constructed that the water shall not be subject
 " to undue evaporation arising from its being put immediately
 " over the flame or light." Above the light at the top of the
 shade a dome or ventilator is applied, which prevents the heat
 acting direct on the part containing the water, but it has been
 found necessary to introduce a non-conducting material between
 the top of the shade and the water reservoir.

Sixth, "the application to gas chandeliers and brackets of
 " glasses or shades into a band, the lower part being inserted
 " from the top," and by preference, supporting it "on two oppo-
 " site radial pins that permit the shade to be pushed aside for the
 " purpose of lighting, extinguishing, or regulating the flame."

[Printed, 1s. Drawing.]

A.D. 1863, January 14.—N^o 115.

KIDD, JOSHUA. — (*Provisional protection only.*)—"Improve-
 " ments in apparatus for measuring the quantity of gas supplied
 " to single burners, and increasing its illuminating power."
 These are as follows:—Between the nib or burner and the gas
 regulator, making "an adjustable aperture or hole for the pas-
 " sage of a certain quantity of gas. This hole is so arranged
 " that it cannot be tampered with by the consumer when the
 " apparatus is in operation, so that the gas passing through this
 " hole at a regular pressure, no variation can occur in the quan-
 " tity of gas passed through the apparatus in a given space of
 " time." It is necessary in adopting regulators in connection
 with this aperture for measuring gas "that this regulator should
 " be so arranged as to give out the gas at a very low pressure,
 " say, from three to five-tenths; by this means the regulator is
 " always in action, even when the pressure is reduced to the
 " lowest point. The gas being consumed at this low pressure
 " must necessarily pass through a nib or burner with a large
 " opening, so as not to cause a check of pressure between the
 " adjusted hole or aperture, and the burner." The regulator for
 this purpose is formed with a valve and disc balanced or floated
 by the pressure of the gas; the valve suspended to the centre of
 the disc opens and closes an aperture for the passage of the gas
 as the pressure varies; the disc may be made to float in mercury,
 or it may be composed of leather or other suitable substance.

" Any burner having a larger aperture than the hole of the measuring aperture may be used, but it is preferred to use a new description of burner, having a round or other shaped aperture from which the gas issues in one body, with a piece of metal or other suitable substance placed over the hole to spread the flame, and on which the gas impinges after its exit from the hole of the burner."

[Printed, 4d. No Drawings.]

A.D. 1863, January 15.—N^o 134.

FERRIER, ROBERT. — "Improvements in wet gas meters." These are as follows: A fluid syphon is applied "on the entrance of gas meters, so that when the water in the meter reaches the low-water line the lights can be made to flicker, and, if water be not added, totally extinguished, or arranged, in the case of large meters only, to flicker until water be supplied." Two narrow divisions are formed in front of the meter, and extend nearly to its entire height; they communicate at the bottom. "The funnel pipe for filling the meter with water enters the first division, and extends to near the top of the second division." The gas is conveyed down the first division near to the water line, it then ascends and passes down a tube into the waste water chamber, and into "the cylinder of the meter in the usual way." From inside the top of the second division a pipe descends through the front of the meter, a little further than the water line. A small cut is made in the pipe near the water line. When by the diminution of the water, the cut of this pipe admits gas, the pressure closes up the supply pipe and is then removed, this alternate action causes flickering, and, after a time, extinction of the lights, until the water is filled up to the proper level. In fountain meters, an air pipe has immediately above it a small tube leading into the fountain; this arrangement secures the steady action of the reservoir. The same principle may be carried out in various ways. Various arrangements to combine and regulate the water line are set forth. An arrangement of the meter and waste water chamber is described, in which no gas can be extracted from the plugs unless registered. A piece of sponge is inserted in one division of the waste water box, to saturate the gas before it reaches the body of the meter.

[Printed, 1s. 4d. Drawings.]

A.D. 1863, January 28.—N° 248.

OGLESBY, JOHN, DICKINSON, JOHN, DICKINSON, WILLIAM MARK, and DICKINSON, JOHN, the younger.—“Improvements in apparatus for steaming, cooking, and generating “gas.” These are as follows, the apparatus is to be made of iron of a square exterior form and set in brickwork; the central portion is to contain the fire-bars, and on each side of the fire are ovens, below which are boilers. The front of the fire-place is to be furnished with slides, for the purpose of enclosing the same. In the fire a retort is placed communicating by a pipe with a vessel containing water, whence the gas passes by a serpentine pipe into a condenser, from thence it is conveyed by a pipe to the purifier, and then passes to the gasometer, and “is afterwards conveyed to “the burners by piping, under pressure.” The condenser is provided with another tube below the position of the exit pipe for the purpose of conducting the tar to a tank. The retort or gas generator “is to be filled with coal or other carbonaceous matter “capable of affording gas by the operation of the heat of the “fire.” “The gas generators may be placed in any suitable “position, and several of them may be arranged in one furnace “according to the number of lights required.”

[Printed, 10d. Drawing.]

A.D. 1863, January 29.—N° 264.

LOUIT, JEAN BAPTISTE EMILE AINÉ.—(*Provisional protection only*).—“Improvements in the glasses, termed chimneys, used for “gas or other lights.” These are “the top of the chimney is “made of a dome or other similar shape, or otherwise closed at “the top, and for the escape of heated air one or more openings “is or are made under the dome or stopping, or say in the sides “of the chimney.” The object is “perfect safety,” and “it preserves ceilings from heat and smoke.”

[Printed, 8d. Drawing.]

A.D. 1863, January 31.—N° 287.

GROSSMITH, JOHN.—(*Provisional protection only*).—“An “improved mode of producing the aura-electric gas.” This consists in “the application of a new radiator by acting upon a “solid, and of the use of a radiating multiplied network forming

"shelves," which presents "more surface for the air to act upon the volatile liquid;" also using "multiplied wire network for every one of the shelves" and thus presenting both top and bottom surfaces for radiation."

By the use of asbestos as a diffuser of the volatile liquid, "the air becomes more readily carburated," and "a carburetted hydrogen gas most brilliant and lasting" is produced. Using no heat or fire "by using horizontal trays of multiplied wire netting, on which a layer of asbestos presents multiplied surfaces," all over and about which "volatile liquid is made to pass," thus generating gas by the cold process. Relying "upon atmospheric and galvano-electric action," using "the positive force of the oxygen by atmospheric pressure," and changing "the polarity of nitrogen from the negative to the positive," sending into the "cylinder positive together with the oxygen, leaving the negative low to work in combustion outside in harmony with the hydrogen uninterfered with by version of polarity and the physical laws of atmospheric pressure without." Using "zinc and copper, platinum, gold, and silver wires," by which to "promote electric activity." "The use of a most delicately constructed valve, which controls the pressure of the gas and prevents any reversion of polarity or flame back into the cylinder, so that explosion is impossible. Using "oxygen 16, nitrogen 14, and hydrogen 1, when a redder light is required," and using oxygen in addition to the foregoing proportions when "a whiter light is required." "The use of more nitrogen and when intensity of heat a greener and bluer light are required," the use of more hydrogen." The use of this apparatus "in the carbonization of coal gas" as "also in the generation of the aura-electric gas."

[Printed, *ad.* No Drawings.]

A.D. 1863, January 31.—N^o 289.

DRUMMOND, WILLIAM. — (*Provisional protection only.*)—

"Improvements in apparatus for stopping the supply of gas to burners when the light is put out." These are as follows:—
 "It is preferred in all cases to employ an inverted cup or hollow vessel with its inverted edges dipping in quicksilver so as to enclose a quantity of air, so that when the gas flowing through the burner has been lighted for a short time and the air

" expanded, the inverted vessel will be raised, and by being
" raised will keep open the supply passage leading to the burner,
" but should the lighted gas be put out the cooling of the air
" will allow the inverted vessel to descend and thus close or be
" the cause of closing the supply passage, or in place of using
" an inverted vessel the confined air may be caused to act on a
" moveable, flexible, or other suitable surface, and thus produce a
" like result." When the above is applied " near the gas main
" or on any convenient part of the supply pipe, the supply of gas
" will depend on the burning of a jet of gas in that locality. In
" order to light the gas at a burner the inverted vessel or other
" arrangement of apparatus acted on by the confined air or gas is
" arranged so as to be readily acted on by hand, so as to allow
" gas to flow to the burner and be lighted, till the heat thereby
" communicated to the confined air is sufficient to act in keeping
" open the supply passage to the burner."

[Printed, 4d. No Drawings.]

A.D. 1863, February 2.—N° 298.

WILSON, EDWARD BROWN.—(*Provisional protection not allowed.*)—"Improvements in the manufacture of gas." These are
" in the manufacture of gas from oil by placing in a suitable
" vessel containing the oil a coil of piping, pipe or pipes," through
" which is passed " hot water, air, or steam at such a temperature
" as shall generate gas from oil contained therein, which vessel
" may be large enough to be but partially filled with oil, leaving
" the remaining space for gas, or a separate receiver with purifiers
" may be connected."

[Printed, 4d. No Drawings.]

A.D. 1863, February 4.—N° 310.

MELLOR, JAMES.—"Improvements in apparatus to be used in,
" distilling, subliming, and drying." These are, in apparatus
" to be used for the above purposes, the application to vessels or
" retorts in which distilling, &c. is performed, " of a series of
" scrapers having an angular, semicircular, or other suitable
" form, to which a reciprocating motion is given by cranks or
" other equivalent agents, thereby causing the materials under
" operation to be continually turning over, and at the same time
" moving forwards." The apparatus " may be applied to the
" following substances :—Tanners' bark, spent dye goods, peat,

" shavings, corn, grain, or other vegetable substances, bones and animal substances, and coals or other minerals," either " for the purposes of distilling, sublimating, or drying " them. The retort or vessel is constructed in the usual manner, and provided with a hopper containing two feeding rollers; it is heated by a fire-grate, underneath which is in communication with a flue passing under the vessel or retort; on the top are two outlet pipes for conveying the gases or vapours to the condenser. The sawdust or other substance in the retort is moved forward by the scrapers and over a ledge at the other end into a cistern below.

[Printed, 10d. Drawing.]

A.D. 1863, February 7.—N^o 348.

CLARK, WILLIAM.—(*A communication from Henri de Lapparent.*)—(*Provisional protection only.*)—" Improvements in the application of gas for the preparation of wood-work generally and iron ships' for their better preservation and reception of paint or other protecting coating, and for disinfecting ships, hospitals, and other places." These are, applying the same process of carbonization as described in No. 328, A.D. 1862, by " means of a jet of inflammable gas, especially lighting gas, or that obtained from oxide of carbon, applied under a certain pressure with an excess of heated air, for the purpose of cleaning such iron structures, as also for preserving exposed surfaces." " The jet of gas burns up and detaches the rust, and completely and rapidly dries the sheet iron, and so permits of the immediate application of a fresh coat of paint or other covering; the gas jet carbonizes the old coating and separates it from the iron which is left clean and dry." This process is also applied " for the carbonization of the holds of ships, whether of wood or iron, on returning from a voyage, and so completely dry the hold and destroy any miasma of vegetable or animal origin which might tend to rot the wood and prevent unhealthiness in the crew, and damage the materials, provisions, or cargo stowed therein." These processes may be applied to the other purposes named above.

[Printed, 4d. No Drawings.]

A.D. 1863, February 7.—N^o 351.

HACKFORTH, MATTHEW. — " Improvements in shades or reflectors for lighting purposes." These are forming shades or

reflectors for lamps or lights of all kinds of porcelain or china. These shades, it is said "are superior in utility to the opal shades " which are sometimes used; they will stand the heat much " better, and their employment is attended with a considerable " saving in the consumption of gas," estimated "at from 50 to " 60 per cent." These shades are "plain or ornamental, and " their shapes may be indefinitely varied to suit the taste of " the public. They may be supported over or around the light " by any of the means commonly employed to support the shades " now in use; for example, by an internal support of metal or by " an external clip, according to the peculiar form of each, and " they may be easily adapted by cheap holders to all kinds of " lights."

[Printed, 4d. No Drawings.]

A.D. 1863, February 14.—N^o 399.

JEFFCOTT, JOHN CRONIN.—"Improvements in the production " and generation of gases, and also in apparatus connected " therewith." These are, producing gas for lighting and heating, " by "utilizing the heat now not used in steam or other furnaces and " open or closed fire-places of every description," by introducing " into them "vessels of various forms, composed of cast-iron, clay, " or other metallic substances, and placed according to the con- " struction of the said furnaces or fire-places," and into these " vessels or retorts are put "the various substances, animal, vege- " table, or mineral from which the gases are to be obtained." The gases are conducted by pipes to the condenser, consisting " of " two cylinders, one placed in the other, the outer one holding " water; the gas on entering goes to the inner cylinder which it " fills, and is there driven by the hydraulic power to the gas " holder in its tank filled with water; saturated with lime, and " holding the salts of soda in solution, through which it passes, " and by this means is perfectly purified and ready to be used." Heating and lighting railway carriages and stations by gas generated in a clay or iron retort in the furnace of the locomotive and the gas "is conveyed by pipes or tubes composed of metallic " substances, or of india-rubber, gutta percha, or other flexible " materials, to the tank and gasholder containing the purifying " material as aforesaid," and is conveyed by pipes to the carriages; " or on the arrival at a station the gas in the gasholder is con-

veyed "into a gasholder erected at the station, when it is ready for use." A new furnace of wrought or cast iron, consisting of "an inner casing with the fire-bars and retort for distilling the coals, and outside another casing to be placed over the entire, so that the heat may be prevented from escaping, and the gases be more freely discharged."

[Printed, 4d. No Drawings.]

A.D. 1863, February 16.—N° 414.

OHREN, MAGNUS. — (*Complete Specification, but no Letters Patent.*)—"Improvements in the construction of gas holders and "and in the mode of rendering gas holders self acting." These are as follows:—It is stated that "great inconvenience (and often danger from closing the wrong valve) arises in changing from "one gas-holder to another, more especially from a heavy one to "a light one, for on opening the inlet of the light one the gas "from the heavy one passes into it before the outlet of the heavy "one is closed; these difficulties may be avoided and the gas "holders rendered self-acting by fixing to the guide bars of the "gas holders, to the columns thereof, or to the gas holder, or to "any other convenient and suitable place, stops or guards either "at top or bottom of same, to catch the guide rollers or other portion of the gas holder, so as to stop the ascent of the gas holder "on reaching the required height; the valves of all the inlets and "outlets of the gas holders being open, the lightest gas holder "will fill first, then the next lightest, and so on in succession "until the whole of the gas holders in action are filled; during "the supply the heaviest gas holder will discharge first." This mode of construction will answer "for any number of gas holders "however far apart, care being taken to stop off each gas holder "with sufficient seal, with the exception of the heaviest one, "which should not be stopped off at all, so that it may 'blow' when "all the gas holders are full." "The inlets and outlets being "all open, any increase in bulk in a full gas holder in sunny "weather will pass through the outlet and go away 'with the "make' to the gas-holder then filling."

[Printed, 4d. No Drawings.]

A.D. 1863, February 23.—N° 491.

MARTINDALE, RALPH.—"Improvements in lamps and burners, "and in apparatus employed for milling or ornamenting parts of

" lamps, which apparatus may be applied to other similar uses." These are, first, in the construction of oil, hydrocarbon, and other similar lamps and burners used for other purposes than lamps.

Second, in reference to this subject, these improvements are applicable "to gas as well as other description of burners," and consist in surrounding the burner with one or more air chambers or cones, each separated from the other by its own wind guard, "for the purpose of steadying the flame, ensuring more perfect combustion, and preventing smoke."

Third, in apparatus for "milling or ornamenting parts of lamps, which apparatus may be applied to other similar uses." "In place of the chock of an ordinary lathe," inserting "a block piece or holder to receive the stamped or shelled work to be milled." In front of this holder fixing "upon a jointed arm in a rest, a lever rod forked at one end to hold a revolving wheel or roller engraved with the pattern or mill, the shell or stamped work being fixed upon the holder, the operator, by means of the lever rod, brings the milling roller into contact with the shell, and thus the pattern or milling is produced upon the shell." "If a pattern or mill be required upon the interior of the shell also, the holder in the lathe is engraved with a pattern."

[Printed, 8d. Drawing.]

A.D. 1863, February 24.—No 513.

BOWER, GEORGE, and HOLLINGSHEAD, WILLIAM.—"Improvements in apparatus for the production and transmission of gas or other fluids." These are "the combination in one apparatus or vessel of the various parts of apparatus used in the processes of cooling, cleansing, and purifying gas with a dry centre change valve alone," and the "construction of a dry centre change valve." The apparatus described "consists of a condenser, coke scrubber, and four purifiers combined with a duplex bye-pass valve and centre valves and connections to each. In the case of many small works, however, a bye-pass valve is unnecessary, and is therefore omitted, the apparatus in such cases consisting of a condenser, a wash vessel (which is formed in the inlet box, and through which the gas is passed after having traversed the condenser), two or more purifiers, and a centre valve with connections. The centre valve box is attached

"to the centre of the side of the purifiers; the centre valve is arranged horizontally in the box, the gearing for changing the position of the plug projecting from the front of the apparatus."

[Printed, 1s. 2d. Drawings.]

A.D. 1863, February 25.—N^o 524.

LAWRENCE, BENJAMIN, and NIBLETT, WILLIAM.—"Improvements in apparatus for regulating the flow of gas for purposes of illumination." These are "placing over and upon the ordinary gas burner a tube or cylinder of any suitable metal or other material fitted at the top with an adjustable cap, piston, or plug. The slits or apertures for the escape of the gas being cut either in the cap, piston, or plug, or in the tube or cylinder," the object being "to admit the gas from the ordinary burner into a chamber for the purpose of allowing it to expand, thereby reducing its pressure," and by "the proper adjustment of the cap, piston, or plug to allow the gas to escape through the slits or apertures at that pressure." The slits or apertures may be disposed in various ways, and the cap, plug, or piston is constructed "so that it shall terminate beyond or above the slits or apertures in a flange or disc, globe, cone, or other suitable figure against which the jets of gas impinge and are caused to form a circle of the required diameter." In preference, the cap, piston, or plug is adjusted upon the principle of the screw and nut, but it may be adjusted by a rack and pinion, or "it may be made self-acting in the shape of a suitably weighted cylindrical valve cover thereon or therein," or otherwise. In some cases it is proposed "to substitute the regulating apparatus itself after having modified it so as to suit the purpose" of a burner. "In cases where a chimney is to be used, the tube or cylinder may be fitted with a gallery, and the admission of the air regulated by a flange or disc screwed to the tube or cylinder underneath the gallery," so "that its distance from the gallery can be increased or diminished at pleasure."

[Printed, 8d. Drawing.]

A.D. 1863, February 25.—N^o 525.

GAILEY, JOSEPH.—(*Provisional protection only.*)—"Improvements in apparatus for the purpose of supplying air for mixture with gases and other aeriform fluids." These are two inverted

chambers or receivers, similar to gas holders, are placed into two outer casings containing water or other fluid, and have alternate up-and-down reciprocating motion imparted to them; in their interior are "air inlet and outlet communications, the inlet being controlled by suitable valves to prevent the ingress, but to prevent the egress of the air, while the outlet passages are similarly furnished with valves to permit the egress of air but to prevent the ingress; these outlet passages communicate with a reservoir to contain the supply of air furnished." Motion is communicated "to the reciprocating chambers by means of a spring train, or it may be a weight, a slight pressure and a small quantity of air only being required." In connection with the train of wheels, using "what is known as the mangle motion, which, although the train always moves continuously in one direction a reciprocating rotary motion is communicated to a wheel by reason of the pinion communicating the motion from the train gearing with a segment of teeth alternately on the inside and then on the outside of the periphery of such segment." To the wheel so actuated, attaching "a rope or chain from the ends of which the inverted chambers are suspended and by which the reciprocating rotary motion of the mangle wheel imparts a slow up-and-down motion to the inverted chambers and so forcing a supply of air." "Instead of transmitting the motion of the mangle wheel by cords or chains, the motion thereof may act as or be communicated by a beam or lever, from the opposite ends of which the inverted forcing chambers may be suspended by suitable rods."

[Printed, 4d. No Drawings.]

A.D. 1863, February 27.—N° 556.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Edme Ernest Mathelin and Pierre Lucien Mathelin.*)—(*Provisional protection only.*)—"A new method of an apparatus for boring into water and gas supply pipes and fixing branch pipes thereon." This consists as follows:—"At the point where the supply pipe is to be pierced," placing "under and round it a metal strap or clip," bringing "the ends of the strap upwards" and passing them through flanges spreading out from the bottom of a tube; between the supply pipe and this tube, placing "a lead, gutta percha, or other suitable washer, and making a hermetic

“ joint by tightening the strap by nuts which bear on the top of
“ the flanges and screw on to the ends of the strap. The tube
“ has fitted in it a tap, and just above the tap the tube is flanged.
“ For the purpose of boring into the supply pipe there is another
“ flanged tube bolted to the tube first-mentioned. In the upper
“ part of this second tube a stuffing box is fitted, and a head for
“ supporting a pressure screw is bolted to flanges on the top
“ thereof. The shaft of a boring bit is carried through the
“ stuffing box and through the water or gas way in the plug
“ of the tap fitted in the tube attached to the supply pipe.
“ A boring bit is fitted in the lower end of the shaft, while
“ the pressure screw passed through the head before-mentioned,
“ bears on the top thereof, a ratchet brace imparts the necessary
“ motions to the bit, and the supply pipe is thereby pierced.
“ The stuffing box at the top of the second tube prevents the
“ water or gas escaping. The boring shaft and bit are drawn up
“ through the passage in the plug of the tap, which is then
“ closed. The parts are removed, from the tube in which the
“ tap is fitted, and the tube with its tap and the strap remain
“ permanently attached to the supply pipe. The branch tube or
“ pipe may be extended as required.”

[Printed, 4d. No Drawings.]

A.D. 1863, February 28.—N^o 565.

FRIEND, JOHN WALTER.—(*Provisional protection only.*)—“ An
“ improved gas meter.” This consists in dry gas meters, “ in
“ employing, in lieu of the ordinary measuring drum or chamber,
“ a vessel of cylindrical form mounted upon a suitable stand or
“ base and fitted with a piston, so as to work freely within the
“ same, and admit of being actuated by the pressure of the gas
“ through the meter, the said piston being packed with mercury,
“ and provided with a piston rod passing through a stuffing box
“ in the top or cover of the cylinder, to which also two parallel
“ plates are affixed, carrying an horizontal spindle which receives
“ motion through the medium of toothed wheel and pulley gear
“ direct from the piston rod, a four-way tap being employed in
“ connection therewith, as also a small gravitating lever and alter-
“ nating stop stud motion, by the rising and falling of which the
“ plug of the tap is carried round to the quarter part, and again
“ on the reverse side in like manner at each up and down stroke

" of the piston, whereby the gas is admitted and regulated to the meter, and the indicators set in motion."

[Printed, 4d. No Drawings.]

A.D. 1863, March 5.—N° 632.

BUCKLAND, WILLIAM HENRY.—"Improvements in the mode of and in apparatus for producing gas for illuminating and heating purposes, parts of which improvements are also applicable for increasing the illuminating and heating power of ordinary lighting gas."

These are, first, carburetting air or gas by causing it to pass over the surface or through woven fabrics or fibrous or spongy substances which have the property of sucking up and exposing the liquid hydrocarbon in a finely divided state.

Second, the apparatus, "whereby the result is or can be obtained." In one arrangement "the carburetting vessel is divided into two compartments, in one of which is placed the porous mass or material, and into which the liquid hydrocarbon is first introduced for the purpose of saturating the porous mass or material." Any excess of hydrocarbon "passes into the other compartment, into which there are apertures sufficient to permit portions of the porous mass or material to project or extend, and dip into the liquid hydrocarbon which has passed into the second compartment," and by capillary attraction keep the porous material saturated. "By introducing partitions into the first compartment of the vaporizing or carburetting vessel," the gas or air travels over a greater surface and becomes more carburetted. The gas or air is either cold or warm, or the carburetting vessel "may be furnished with a jacket to contain either warm or cold water." A modification of the above apparatus may be used.

[Printed, 10d. Drawing.]

A.D. 1863, March 6.—N° 638.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from William Elmer.*)—"Improvements in the manufacture of illuminating gas, and in apparatus employed therein." These are, first, "the manufacture of illuminating gas by decomposing fluid hydrocarbons in the presence of hydrogen previously prepared for the purpose, the hydrogen being supplied in the

“ proper relative quantity to combine to form olefient gas with the products of the decomposition of the hydrocarbons.”

Second, “Apparatus for working out the above.”

Third, “the employment of zinc in the retort in which water is decomposed.”

Fourth, “the combination of the retort for the decomposition of water with the retort for the formation of illuminating gas, through the intervention of a condenser.”

Fifth, “the combination of a heating apparatus,” “so as to heat steam previous to its decomposition.”

Sixth, “the combination of a heating apparatus” so as to “heat the hydrogen previous to its introduction into the retort in which the illuminating gas is to be formed.”

A lower retort, called the hydrogen retort, is connected with an upper retort called the hydrocarbon retort; a condenser consisting of a series of cells is interposed between these retorts, the hydrogen passes from the condenser to the hydrocarbon retort through a pipe which is highly heated. “The hydrogen retort should be kept at a temperature just high enough to vaporize a sufficient quantity of the zinc to decompose the water, and this temperature may be regulated by varying the admission of air to the ash-pit of the furnace by means of a register.” “The products of the decomposition of water by commercial zinc are hydrogen, oxide of zinc, and some immaterial traces of other substances; the larger quantity of oxide of zinc remains in the hydrogen retort, and is removed previous to supplying a new charge of zinc: a portion is, however, found in the condenser. The oxide is collected and washed to fit it for market.”

[Printed, 1s. 4d. Drawings.]

A.D. 1863, March 11.—N^o 664.

FULTON, WILLIAM GEORGE ALEXANDER, and CLYDE, JACKSON.—(*Provisional protection only.*)—“Improvements in dry gas meters.” These are, adapting “dry gas meters to the foot or base of the pillars or columns of street lamps,” by “forming an inlet aperture in the bottom or lower part of the gas chamber, and in connecting the supply pipe directly therewith, so that the gas may enter at once into the gas chamber.” The outlet is formed “from the top and centre of the meter case.”

[Printed, 4d. No Drawings.]

" is built up of horizontally or obliquely disposed strips, prisms, tubes, rings, or coils of glass, and in the case of flat-sided lamps or lanterns, such component pieces may be disposed either vertically, horizontally, or obliquely."

Second, " various arrangements of lamps suitable for shop windows," &c. In one modification " a hollow gas-tight globe or vessel wholly or partially transparent is employed. The gas is admitted into this vessel by one or more tubes, and leaves it by one or more burners or branches fitted into different parts of the vessel, so as to have no apparent connection with the gas pipe." A globe of this kind may have a ring of burners round it so as to be devoid of shadow. The same arrangement " may be adopted in the case of sunlight or starlight convex reflector lamps, the burners being projected through the reflecting surface." Such lamps may be poised or suspended " and be made to rotate by giving the jets more or less of a tangential direction, or by any of the means " described in No. 485, A.D. 1862. " In another modification the gas entering the globe or vessel may in a similar way be made to impart rotation to figures or devices enclosed in the vessel. The glass vessels may be made with double shells, and coloured fluids may be introduced between the two; the vessels may also be ornamented in a variety of ways." With double shells the gas may be introduced between the two shells. The lamps may " be attached to a pendent tube, to a bucket, or to a pillar." Reflectors for starlights are formed " of segmental or other component pieces of crown, sheet, or plate glass, either plain or fluted, or otherwise ornamented," but to the required form and silvered or gilt, &c.

Third, " lowering, sliding, or hinge arrangements of lanterns, lamps, gasaliers, gas brackets, and the like." " One improvement consists in counterpoising the weight of a gasalier by springs with fusee barrels concealed in the lower ornamental part of the gasalier instead of being arranged above as hitherto;" or, " the counterpoising may be effected by means of a helical spring coiled round the smaller tube, whether sliding or fixed, and such sliding portion may be in two or more parts arranged like telescope tubes." Blade or other powerful springs of short action may be used for counterpoising the lamp or gasalier, the movements due to them being enlarged by means of differential pulleys or levers," which " may also be used in place of weights, and if reversed, lighter weights or springs may be employed."

" In another arrangement, two or more sliding tubes with water or stuffing box joints may be employed, being disposed either vertical and parallel or obliquely, hinge joints being required at the extremities in the latter case."

Fourth, suspending gasaliers, &c., or parts thereof requiring to be raised and lowered by one or more flexible, but by preference, non-extensible and non-compressive tubes."

In one modification the tube is bound upon a barrel to which a counterweight or spring is applied, the gas being admitted by a gas-tight joint at the axis of the barrel. " In another modification a gasalier is suspended by two or more flexible tubes passing over pulleys and returning down to a central sliding pipe or suspending tube with counterpoise." The balance weights and the like may be suspended by flexible tubing, and gas supplied thereby, burners fitted to the weights which may have reflecting surfaces or be fitted with globes or shades. " In another modification a helical coil of elastic tubing connects the lower part of the gasalier to the gas pipe, but the weight is borne up by separate means." In the Provisional Specification, after describing these last improvements, reference is made to certain appliances connected with hall lamps and the like, but any claim respecting the same, it is said, is now withdrawn, having " been informed that they are not so novel " as they were believed to be.

Fifth, " in constructing swinging gas brackets," employing " a kind of direct joint of a spherical or generally similar form, and having the gas tap in the joint instead of the ordinary one, this joint being arranged in various ways." Two modifications of this are given.

Sixth, in gas brackets, arms of gasaliers, and pillar or stand gas lamps, arranging the parts to elongate or shorten by means of sliding arrangements of various kinds.

Seventh, for lighting, a gas burner is employed having " two saw-cuts or slits " in " the top of the burner, being inclined towards each other, so that the issuing films of gas impinge against each other. The slits are cut across the reduced point of the burner, but the sides of the slits are closed by a small ring."

Eighth, for heating, a burner " of the Bunsen class is formed by a metal tube perforated at its lower part for the admission of air, and having fitted to it a cap piece, disposed so that the mixed gas and air issues in a circular flame; or the cap or the

"top edges of the tube may have slits formed round it for the gas and air to issue. By another plan the Bunsen burner is arranged on the Argand principle, so as to admit a distinct air current into the centre of the circle of gas jets."

Ninth, "to facilitate the lighting of stoves or open fires, one or more of the fire-bars are made hollow and with perforations, and these bars are connected to a gas pipe. The perforations are, in preference, "in recesses formed in the sides to reduce the risk of their being choked by dust."

Tenth, "forming the covers or external casings" of stoves or of portions thereof of "fire-clay, earthenware, stoneware," or the like, in any convenient number of pieces, shaped so as to present ribs, gills, projecting blades, corrugations, or otherwise multiplied surfaces for the radiation of heat." Several forms of the cover or external casing are given.

[Printed, 1s. Drawing.]

A.D. 1863, April 15.—N° 947.

BONNEVILLE, HENRI ADRIEN.—(*A communication from Theodore Berents.*)—"Improvements in the construction of gas burners." These are, the construction of such burners by means of which the combustion of the gas operates without pressure by the holes of a reservoir placed above the tube which regulates the supply." The gas enters through "an elbowed tube, the upper extremity of which is provided with two small holes by which the gas flows, and which serve for regulating its supply;" on this is a screw joint connecting it with a reservoir, the upper part of which "is pierced with a larger or smaller number of holes in a straight line, by which the gas flows for combustion." The screw joint allows the reservoir to be removed for cleaning. "To increase the lighting power of the gas and render the flame steady," a glass or chimney of an oval form, "the upper part of which is slightly contracted, may be employed." The reservoir having "an oblong form, the sides of the glasses of the described shape are at equal distances from the flame, and facilitate the combustion."

[Printed, 8d. Drawings.]

A.D. 1863, April 16.—N° 956.

BAGGS, ISHAM, and SIMPSON, WILLIAM.—"Improvements in purifying and treating coal gas, sulphuretted hydrogen, and

" other gases containing sulphuretted hydrogen, and in obtaining sulphur, sulphuric, and other acids in such treatment." These are, the employment of metallic salts and oxides or bases as follows :—"First, by passing the gas through or in contact with, as an example ; " a solution of sulphate of copper or sulphate of copper and oxide mixed, the oxide maintained in suspension by constant agitation." Sulphide of copper is formed and " roasted with excess of air produces either sulphate of copper again, or oxide, or a mixture of the two according to the heat employed or the time consumed." " Other salts of similar power may be used in a similar way." " To abstract the carbonic acid from coal gas," it is passed " through water containing a metallic oxide in suspension ; oxide of zinc, copper, or other metal will answer the purpose. When the oxide is saturated with gas the water is drawn off, and the oxide recovered by exposing the carbonate so produced to a red heat." " In some cases " magnesia is used for this purpose.

Second, " exposing the cleansing materials above-named and referred to in a state of powder formed into a porous mass " by mixture with breeze, pumice stone, &c., " the gas being caused to permeate or filtrate through the mass." Gases containing sulphuretted hydrogen are passed " through a sulphate in a state of solution or suspended in water, or otherwise, preferring " anhydrous sulphate of copper." " Sulphur becomes precipitated when the gas containing sulphuretted hydrogen is passed into a solution of a metallic super salt ; as, for instance, persulphate of iron." Nitric and acetic acids are obtained when nitrates and acetates are employed to " act upon the sulphuretted hydrogen." Insoluble metallic salts, such as sulphate of " lead, when used in this way, should be employed in a state of mixture with water, or as a thin paste, or finally in a moistened state, upon the shelves of a dry lime purifier." The sulphide is separated by " subsidence or filtration from the liquid portion of the product," and washed or otherwise is calcined " for two or three hours or more, till oxidation has more or less completely restored them to their original condition and rendered them fit for the purification of further portions of gas." The liquid or soluble portions are boiled down or concentrated in order to obtain the valuable acids or the salts of ammonia produced in

"the process." "The method of recovery here described may be repeated ad infinitum."

[Printed, 4d. No Drawings.]

A.D. 1863, April 17.—N° 967.

CLAPHAM, ROBERT CALVERT.—"Treating the waste liquors from bleaching powder stills in order to obtain hydrochloric acid and other products therefrom." These are, in reference to this subject, as follows:—The waste liquors above are conducted into a furnace and distilled, or distilled in a retort, and the hydrochloric acid collected; or "ground manganese is added to the solution in the furnaces or retorts," and after heating a suitable time chlorine is obtained. "The residue in the furnace or retort, which consists of chlorides of manganese and iron, may be applied" to a number of purposes which are named, among which is, "the separation of sulphur from coal gas."

[Printed, 4d. No Drawings.]

A.D. 1863, April 18.—N° 972.

SIEMENS, CHARLES WILLIAM, and SIEMENS, FREDERICK.—"Improvements in furnaces which are principally applicable to the smelting of iron." These are, first, "constructing furnaces in which coal or other carbonaceous material is subjected, whilst descending gradually in upright recipients or retorts, to the action of intense heat resulting from the application of regenerators with reversal of currents, the result being either the total conversion of the carbonaceous matter into combustible gases when a grate is applied at the bottom of such recipients, or the production of both combustible gases and coke of superior quality when admission of atmospheric air to the bottom of the recipient is prevented."

Second, "arranging and heating upright chambers or retorts in such a manner that highly illuminating gases, such as acetylene, propylene, and analogous compounds are formed by the union at a white heat of the necessary constituents for the production of these gases, such constituents being the first results of the decomposition and partial combustion of the

“carbonaceous material gradually descending in the said chambers or retorts.”

Third, constructing furnaces for “the production of combustible gases and coke from coal or other carbonaceous matter in such a manner that the gases issuing from the incandescent mass near the lower extremity of an upright chamber or retort, containing such material, deposits its heat and also soot in a regenerator, which heat is subsequently imparted to a current of air, with or without the admixture of steam, which in traversing the same regenerator in the reverse direction burns the soot there deposited, and after having in traversing the mass of incandescent fuel been converted into a combustible gas, imparts heat as well as a certain deposit of soot to a second regenerator, until the direction of the current is again reversed, the column of fuel being replenished continuously or from time to time through a feed apparatus at the upper extremity, and the coke withdrawn from side openings below water at the lower extremity.”

Fourth, “the same combination of regenerators with an upright recipient in which coal gradually descends, as described in the third claim, with the substitution of a grate for the water tank at the bottom of the apparatus, for the purpose of effecting the entire conversion of the carbonaceous material into combustible gases.”

Fifth, so combining coke, and gas ovens, of the above construction with blast or other furnaces for the reduction of metallic ores, that while the whole or part of the coke produced is charged with the ores to effect their reduction, the gases or a portion of the same (being by preference washed and heated on their way) are forced into the same blast or other furnaces, together with atmospheric air (also by preference previously heated) to effect their combustion, in order to generate the heat necessary to complete the operation of the blast or other furnace, the object being economy of fuel and greater freedom from sulphur and other impurities of the metals produced.”

[Printed, 1s. Drawing.]

A.D. 1863, April 25.—N^o 1031.

CLARK, ALBERT HENRY, and HOPE, HENRY.—(*Provisional protection only.*)—“Improvements in valves for water, steam, and “gas.” These are, making “the seat of the valve in a plane in

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" which the axis of the pipe is situated, the ingress and egress
 " pipes being placed on either side of and opening respectively
 " above and below the said seat. The valve rises and falls in a
 " line at right angles to the axis of the pipe." The valve is
 " fitted to a stem or axis, the upper part of which is made into a
 " screw;" the lower cylindrical part of the " stem or axis passes
 " through a stuffing box, which is fixed upon and closes the
 " opening in the pipe at which the valve is introduced; the upper
 " screwed portion of the stem or axis works in a concave screw
 " in the plate closing the top of the stuffing box." By means of
 a winch or handle on the top of the valve stem or axis the stem
 or axis can be turned, and the valve raised or lowered. " The
 " height to which the screw is raised out of the stuffing box indi-
 " cates the height to which the valve is raised from its seat. The
 " gland by which the packing is compressed around the cylin-
 " drical part of the valve stem is held down by screws engaging
 " in the top of the stuffing box." The valve may either have a
 leather or india-rubber washer, " or it may be wholly metallic and
 " of a conical figure. In this case it fits on a conical valve seat."

[Printed, 4d. No Drawings.]

A.D. 1863, April 25.—N^o 1041.

STROUD, JOHN THOMAS.—(*Provisional protection not allowed.*)

—" Improvements in the manufacture of, and in the machinery
 " and appliances for, holding, drilling, turning, tapping, fitting,
 " and shaping certain parts of steam, water, gas, and lamp
 " fittings."

These relate, first, to a machine " for turning, drilling, and tap-
 " ping the inside and outside of fittings, and consists of the
 " means of holding the dies and tools, which are made to advance
 " and retire by means of eccentrics consecutively brought into
 " action for performing these operations."

Second, apparatus which is duplex in character by which two
 or more distinct tools are enabled to be put in motion, " causing
 " them to advance and retire in the order in which they are
 " required, thereby drilling, turning, and tapping the work."
 This apparatus is " generally so arranged that the motion regu-
 " lating the tools may be disconnected, so as to throw in or out
 " of gear any of the tools, which are all self-acting; and when
 " the work is performed, the operator, by means of a handle

“ simultaneously expands the parts that hold the work, thereby
“ permitting the ready removal and replacement of the work as
“ it proceeds.”

Third, “an arrangement for clearing out hollow parts of fittings to the exact size required, and following up the operation, when required, by a self-acting tap for tapping or screwing the part so cleared out, provision being made for regulating the tapping motion according to the thread required, and a compound holder so arranged that the action of the foot, or otherwise, liberates the work from the apparatus.”

Fourth, “an apparatus for drilling, tapping, and turning, the drill and tap being arranged for receiving independent motions, the work being held between adjustable jaws, and by a cam shifted from the operation of the drill to that of the tap,” increasing the power when necessary by geared wheels; this is also applicable to the other apparatus described.

Fifth, “a reciprocating spindle deriving its motion by means of arms and a gut, or its equivalent, fastened first to one arm passing around the spindle, and then to the other arm by which means a backward and forward revolving motion is imparted. A modification, “using a sliding bar to guide the gut or its equivalent into its place,” and a further modification, obtaining the backward and forward motion by a shifting band in connection with bevelled wheels.”

Sixth, apparatus “for centring as well as drilling” certain work; this is effected “by an adjustable rest fixed in front of a revolving tool, and which rest is fitted with radial adjusting bolts, and against the inner angular ends of these bolts the work to be operated on is placed and held by a lever to the operation of the tool.” As a modification of this, using, instead “of adjustable bolts, moveable dies;” and as a further modification, using “two or more guide bars.”

Seventh, for holding of work when cutting flat surfaces thereon; this is effected by “an arrangement placed in front of a revolving cutter suitably put in motion; the apparatus has an advancing and retiring motion at right angles with its centre, so that such plain surfaces are accurately produced, and by the centre or centres being arranged with a dividing plate, the surfaces are accurately divided, and with the necessary alteration of tools and parts this apparatus is rendered capable of doing the heads and thumb bits of plugs and such like parts,” and, if necessary,

increasing the number of cutters and articles to be operated on, and sometimes applying "a traversing motion to the rest that holds the work."

Eighth, "an arrangement for turning articles of any shape, and consists of a spindle and pulley for giving motion to the work, and a chuck for holding the same," constructed thus: "the part that holds the work has a conical base, which works through a hole in the front, and is held up by a back centre; by this contrivance the work and chuck revolve together for the operation of the tools." There are modifications of this chuck. The rest for receiving the turning tools may be single or compound, and have an oscillating or reciprocating motion; the tools are regulated and advanced to the work by a templet, the exact shape and form of the article desired to be turned."

Ninth, in pulley wheels used in raising or lowering lamps, forming their peripheries of short pieces of tube, and by placing them between two revolving collars and applying pressure to the centre, which will be sufficiently depressed to form a groove for the chain."

Tenth, for upright drilling, using "a bed supporting at the back a regulating centre, and in front open jaws fixed to a slide, which when the operator puts his foot on a treadle below, the jaws close, and carry back the work until the centre at the back enters an inverted centre." In the process of rimering, modifications of the above apparatus are employed.

Eleventh, for outside turning and screwing, having a hollow spindle with holes in which tools are placed; this being set in motion the work is passed "through the spindle and tools by means of a following-up headstock fixed on each end."

Twelfth, a machine fitted with brace and turning screw placed perpendicularly with an elastic coil band, and by placing the foot upon a treadle the turning screw is pressed upon the work to be screwed.

Thirteenth, a chuck for holding dies which are adjusted. For holding tubes, &c., to be screwed, having a conical hollow following-up headstock, into which is inserted a hollow split spindle, in which is put the article to be screwed, and pressing the spindle into the headstock securely holds the article.

Fourteenth, a duplex tool by means of which a screw is made at one operation both inside and outside of a piece of work.

Fifteenth, many of these "improvements, described under separate heads, are more or less applicable to and may be used with the apparatus separately described."

[Printed, 4d. No Drawings.]

A.D. 1863, May 5.—N^o 1117.

KENT, ROBERT GEORGE.—"Improvements in the construction and arrangement of shades and reflectors for gas lights." These are, first, making shades of "an elliptical form, the material employed being either glass or porcelain;" these are used in combination with "fish-tail, bats'-wing, oval, argand, or other gas burners giving a flame of an elongated form," by which the light "is more perfectly diffused and reflected than by the arrangements hitherto in use." These shades are adjusted by means of suitable fittings well understood.

Second, constructing reflectors of an elliptical form, and "of glass or metal, or combinations of glass and metal, or any substance or substances possessing the requisite powers of reflection, and the surfaces thereof may be either smooth, or cut, or corrugated so as to reflect the rays of light in any desired direction. The reflectors are placed in any desired position with reference to the flame, and may be used with or without the shades as may be desired."

[Printed, 8d. Drawing.]

A.D. 1863, May 7.—N^o 1143.

BOWER, GEORGE, and DICK, ALEXANDER.—"Improvements in the purification of gas ordinarily used in illuminating, and in the reduction of ores and smelting of metals by means of such gas so purified." These are, passing the gas through "a heated retort or other vessel containing rich iron ore or oxide of iron in pieces, the reduction of the ore or oxide to metallic iron sponge will take place as the gas passes over and through it, and the sponge thus produced and heated will serve for the decomposition of the sulphur compounds, forming sulphuret of iron and other combinations of sulphur and iron." "Gas manufactured for lighting purposes should undergo the processes ordinarily employed for purification" before being further purified as above. "Whilst gas for metallurgical operations where the presence of ammonia, carbonic acid, et cetera, are of

"no consequence, may or may not undergo a previous purifying
"or cleaning process before being employed."

[Printed, 4d. No Drawings.]

A.D. 1863, May 22.—N° 1287.

STEVENS, GEORGE.—The object of this invention "is to economise fuel by making gas at the same time" with "hard coke," and it consists "in building a coke oven below and an oven or retort for generating coal gas above, and in heating the latter with the surplus heat from the coke oven." "In order to assist the combustion of the unconsumed gases and vapours arising in the early stages of each charge of the coke oven," flues are formed "to admit atmospheric air in small quantities through perforations into the flues surrounding the" gas retort, and this supply of air is regulated by a ventilator.

[Printed, 8d. Drawing.]

A.D. 1863, May 25.—N° 1313.

GIRARD, HIPPOLYTE BENIGNE.—"Improvements in the heating of every industrial and private apparatus by means of the oxygen and hydrogen gases combined and obtained from the decomposition of water." These are said to be "the application of the oxygen and hydrogen gases in combination to the heating of every description of apparatus," the means afterwards described in combination, every possible application of the gas receiver, termed safety apparatus, and other parts of apparatus. A vessel resembling a still is filled with water and placed over a fire; to this still is connected a tube of platinum inside of which are several washers of platinum gauze; socket cocks are set at each end of this tube. This tube is placed in a fire-clay tube furnace of oval shape, pierced at both ends "by a circular hole to receive the platinum tube which traverses its entire length. An opening made on the lateral sides of this furnace is intended to receive the end of the gas blow-pipes." A copper tube leads from the platinum tube, and from this another tube passes into a trough with water, beneath a bell jar, in the top of which is a stop-cock to which is attached a tube which conducts the gases into a gas holder. The object of the trough, it is said, is to cool the gases before they enter the gas holder. The gas from the gas holder is led by a caoutchouc tube into a metal tube in which

there are a series of washers, and passes from thence into a drum furnished with five small tubes which are attached to the blow pipes. The blow pipe for the combined gases is "composed of a capillary tube preceded by a series of wire gauzes, a tap, and a calumet or nipple." The blow pipes for the oxygen and hydrogen gases separate, consist of two such tubes which join at the end of the blow pipe. "An apparatus termed safety blow pipe" may replace the gas blow pipe. This consists of a receiver three parts filled with oil. The gases are made to pass through a tube provided with wire gauzes to the bottom of the receiver, and passing up through the oil are conveyed into the furnace by a blow pipe which has also wire gauzes within it. "To commence the operation four safety apparatuses are required because the gases are separate," and the double tubed blow pipes are used; "but upon the production of a sufficient quantity of the said gases combined," these gases are used "with single blow pipes."

[Printed, 10d. Drawing.]

A.D. 1863, May 28.—N^o 1338.

GORE, GEORGE.—"Improvements in gas burners and in gas furnaces." These are first, in gas burners taking "a circular disc of sheet copper, of a diameter equal to about the height of the burner to be made, and having a hole in its middle a little less than the diameter of the finished burner," and making a series of radial corrugations in the disc, by doing which the metal is gathered up around the central opening. In this way giving "to the corrugated disc the general figure externally of a cylinder, the lower end of the cylinder being plain or tube like, a series of corrugations setting in from the said plain end and gradually deepening towards the other end, where some of them approach so near as almost to touch each other in the axis of the cylinder." This corrugated cylinder is fixed "on an open tube of brass or other metal to form the complete burner, and by means of a stop-cock inflammable gas is admitted near the bottom of the said tube." "Atmospheric air ascends in the radial spaces between those through which the gas rises, and there is thus produced alternate sheets of air and a mixture of air and gas," the gas rises in those portions of the corrugations which open into the cylinder, and the air rises in those portions of the corrugations which open outside the cylinder into the atmo-

" sphere." Although the radial arrangement is preferred, yet the
" parts of the burners may be so arranged that the alternating
" sheets of the combustible gaseous mixture and atmospheric air
" may be either parallel or in concentric circles."

Second, in gas furnaces, fixing " the burner described or other
" burner at the bottom of a vertical tube of fire-clay, which is
" bulbous internally at top, and has in the lower part of the bul-
" bous portion projections, on which a crucible can rest." This
tube is supported " in the axis of a vertical hollow cylinder of
" sheet iron, lined with fire-clay. The said cylinder is fixed upon
" a sheet iron disc, through which the top of the burner projects
" slightly into the tube of fire-clay. The said cylinder is closed
" at top by a fire-clay slab, having a central opening closed by a
" ring and plug. A chimney opens into the side of the cylinder
" near its bottom, and extends upwards five feet or more accord-
" ing to the draft required. When the gas is ignited the flame
" ascends within the tube of fire-clay, heating the crucible sup-
" ported at its upper part. The flame then descends outside the
" said tube, and the products of combustion pass off by the
" chimney." By removing the plug at the top, the contents of
the crucible may be inspected, and by removing the ring also, the
crucible may be removed or introduced into the furnace. " In
" large furnaces one large burner or a series of small burners
" may be employed."

[Printed, 1s. 6d. Drawings.]

A.D. 1863, June 12.—N^o 1477.

JONES, JOHN.—" Improvements in gas regulators." These
are first, " the use of galvanized iron for gas regulator covers or
" discs."

Second, " the use of brass or other unoxidizable valve seats in
" order to insure the effectual working and operation of the gas
" regulators."

[Printed, 8d. Drawing.]

A.D. 1863, June 16.—N^o 1501.

SHEDLOCK, JAMES JOHN.—" Improvements in valves for the
passage of steam, gas, and fluids." These are " the method of
" regulating the flow through valves by means of the combined
" arrangement of the spiral acting upon the back of the valve,

“ and the pin attached to the plate or carriage substantially ” as follows :—A suitable box or body is provided, having inlet and outlet passages. “ In the interior of the case or body ledges or “ guides are fixed for the purpose of carrying a plate or carriage, “ upon one end of which is fixed the valve. A pin or projection “ is securely fixed in the plate or carriage, at a distance from the “ valve corresponding with a spiral, which is fixed on a spindle. “ The spindle passes through the box or body, and is received “ and encased in a stuffing box to prevent any escape from the “ box or body. The pin on the frame regulates the opening “ and closing of the valve by being made to fit the inner side of “ the spiral projection.” Upon giving “ a rotatory motion to the “ spindle, the spiral draws the pin nearer to the centre of the “ plate on which the spiral is formed, and consequently opens “ the valve to allow the passage of the steam, gas, or fluid. By “ reversing the movement, the spiral presses against the back of “ the valve until the point of pressure on the spiral has arrived “ at its greatest distance from the centre of the plate, when the “ face of the valve is forced against its seat, and effectually cuts “ off the flow of steam, gas, or fluid. The valve may be made “ either flat, conical, or circular, according to the form of the “ seat ; any suitable metal may be used for the valve seat, but if “ preferred the valve may be faced with any elastic substance.”

[Printed, 10d. Drawing.]

A.D. 1863, June 17.—N^o 1517.

SPENCER, JOHN FREDERICK.—(*Provisional protection only.*)—
 “ Improvements in steam, gas, and water tube joints.” These
 are, “ instead of making joints between the ends of the tubes and
 “ the tube plates of tubular or tubulous vessels by means of
 “ screwed glands, compressed wood ferules by rivetting over the
 “ tube end or expanding the end of the tube by means of a
 “ ferule (taper or conical) inserted within the tube, or any other
 “ of the means heretofore employed for such purpose,” employ-
 ing metal ferules (iron, steel, gun metal, &c.) of the form and
 in the manner as follows :—“ The tube has holes, drilled or
 “ otherwise formed true, of a diameter larger than the external
 “ diameter of the tubes, so as to admit of a ferule being inserted
 “ and such holes may either be parallel or be slightly taper or
 “ conical. Each end of each tube being first made cylindrically

" true and smooth, and the tube being sufficiently long to project through each tube plate to some extent, and the iron, steel, or other metal ferule (therein described) is forced over or driven on to the end of the tube, and into the annular space left between the external diameter of the tube and the interior surface of the hole in the tube plate." The ferules employed are formed "with a shoulder or bend at one end of a sufficiently increased diameter, to enable the ferule to be withdrawn from off the end of the tube and out of the hole in the tube plate, by means of a fork-like instrument or suitable lever tool employed for that purpose."

[Printed, 4d. No Drawings.]

A.D. 1863, June 17.—N° 1523.

NAYLOR, WILLIAM.—"Improvements in apparatus for compressing, holding, and regulating the pressure of gas."

These are first, "the general construction, arrangement, and combination of apparatus for compressing and regulating the pressure of gas."

Second, "the combination with two gas pumps, one of which is of larger area than the other, of a counter weight and lever," which "moves through the arc of a circle, offering its greatest resistance as the larger pump commences its stroke," so as "to assist the pumps during the high pressure portion of their stroke, and equalize the resistance to the motive power."

Third, "the application and use of a compressed gas receiver provided with a weighted piston," so as to offer "a nearly constant resistance to the pumps in compressing the gas." "Such holders may be carried on a truck to the trains to give the necessary supplies."

Fourth, "the regulating or reducing the pressure of gas by a valve held to its seat in a state of equilibrium, or nearly so, by the pressure of the gas above and below it, in combination or not, with springs."

Fifth, "the application and use of an inverted cup or bell, or of a disc or diaphragm and fluid chamber in combination with, an equilibrium valve," for regulating the supply for one burner, or a greater number. The inverted cup has its bottom edges immersed in water, mercury, oil, or any other suitable liquid, so as to prevent the gas escaping, and by a slight force under

“ the inverted cup, acting with the piston before referred to, raise
“ the valve to its seat and prevent any excess of pressure being
“ given to the burners.”

Sixth, “ the application and use of a disc or diaphragm in
“ combination with a fluid or liquid chamber (placed over the
“ disc), for the purpose of regulating the pressure of gas, and
“ for preventing any undue vibration of the disc or diaphragm.”

Seventh, “ the application and use of a hollow piston or plunger
“ working in a cylinder in combination with an inverted cup or
“ bell, or with a disc or diaphragm and fluid chamber.” The piston
is placed “ under the inverted, cup, disc, or diaphragm. At one
“ part of the long hollow piston, perforations are made through
“ its side.” “ In the middle part of the cylinder there is a recess
“ round the interior of the cylinder, through which the high-
“ pressure gas is admitted to the hollow piston,” from whence it
flows “ into a chamber under the inverted cup, disc, or dia-
“ phragm, causing it to rise, carrying with it the hollow piston,
“ until its perforations in its sides are no longer in connection
“ with the recesses in the cylinder, and thereby prevents any
“ further supply entering, except such as is required for consump-
“ tion.”

[Printed, 1s. 6d. Drawings.]

A.D. 1863, June 19.—N^o 1532.

REYNOLDS, HENRY.—(*Provisional protection only.*)—“ An im-
“ proved method of rendering atmospheric air fit for illuminating
“ purposes, and of increasing the illuminating power of inflam-
“ mable gas.” This consists in “ partially filling a chamber or
“ chambers with a porous or fibrous material, such as sponge,
“ cotton, horsehair, or some substance having a porous or capil-
“ lary quality,” and then charging the chamber or chambers with
“ a volatile fluid hydrocarbon,” displacing “ the hydrocarbon by
“ atmospheric air or ordinary gas, and allowing the air or gas to
“ remain in contact with the porous or fibrous material saturated
“ or coated with the fluid hydrocarbon, by which means the air
“ or gas becoming impregnated with the vapour of the hydro-
“ carbon, the former is rendered fit for illuminating purposes, and
“ the latter has its illuminating power increased.” It has been
“ found convenient to employ two or more saturating chambers,

" which are alternately charged with the volatile hydrocarbon
" and air or gas, and these chambers may be made to revolve
" upon an axis much in the same manner as the chambers of an
" ordinary wet gas meter, the water being replaced by a fluid
" volatile hydrocarbon of a light specific gravity."

[Printed, 4*l*. No Drawings.]

A.D. 1863, June 22.—N^o 1567.

MAJOLIER, LOUIS ANTOINE.—(*A communication from Henry Nordhoff.*)—"Improvements in apparatus for carburetting gases." These are "the construction and arrangement of apparatus for carburetting gas," and in so doing employing a reservoir for containing carburetting liquid, and also in employing "a vessel for containing fluid set beneath the said apparatus, and kept at a certain temperature by a jet of gas supplied from a pipe led from the carburator itself," as follows:—There is a cylindrical vessel, in preference of copper, it is divided vertically into three compartments by perforated partitions, the perforations commencing "about midway between the top and bottom of the apparatus," and extending down "to within a few inches of the bottom thereof." A series of wicks extend from the top to the bottom of the central compartment. There is a reservoir, made by preference of glass, at the upper part of the apparatus, provided with a long neck, which accurately fits a pipe which passes nearly to the bottom of the carburator. "The reservoir has no communication with the atmosphere, and maintains the carburetting liquid at a constant level, and in such manner that, as the carburetting liquid becomes consumed, air is admitted by the tube fitted to the upper part of the carburator, and thus allows the liquid in the upper reservoir to flow down continually, and so keep the wick saturated with the carburetting liquid." The gas enters the first compartment, permeates the wicks in the second, and passes off by a pipe from the third compartment. The carburetting apparatus is provided with a double bottom, in which is water, and which when required may be kept heated by a small jet of gas. An apparatus is described not divided into three compartments. The gas enters the bottom of the carburator, passes through the wicks and out by a tube at the top.

[Printed, 10*d*. Drawing.]

A.D. 1863, June 22.—N° 1569.

CLARK, WILLIAM.—(*A communication from Joseph Chapu and Jacques Charrié.*)—"Improvements in apparatus for charging air " or gases with combustible vapours." These are as follows:—There is a bell-shaped vessel in which is water, and on which floats an ethereal or volatile liquid both occupying about half of the vessel. At the top is a cock for admitting air from a receiver or gasometer above the liquid into a space which serves as a regulator for the passage of air, by means of a fan wheel placed in this space. The air in traversing the space imparts rotary motion to this wheel, which is mounted on a shaft, and the speed of this wheel, as will afterwards be seen, "is proportionate to the " quantity of air introduced." The air escapes by a tube into a ball at the top of the bell-shaped vessel, which may be heated, and from thence it passes by two tubes into a receiver beneath the bell-shaped vessel, containing "a layer of volatile liquid " proportionate to the quantity of air passed, which is renewed as " herein-after described." These tubes are each attached to a series of pipes, each pipe having a nozzle or rose below the surface of the inflammable liquid. The air thus charged with volatile liquid passes off by two tubes from the upper part of the receiver "to the different apparatus in which it is to be used." "The method in which the receiver is kept constantly and regularly supplied (with inflammable liquid) in proportion to the quantity of air passed, is as follows:—The axis of the fan wheel above named is hollow and carries two hollow arms which are S shaped, and each arm on dipping into the liquid contained in the bell-shaped vessel carries with it a certain portion of the liquid into the hollow axis of the fan, from thence it passes into a vertical tube which dips into the lower reservoir. In proportion as the air supply increases, the speed of the hollow arms increases, and thus the supply of volatile liquid is also increased. Air may be supplied by any suitable blowing apparatus, but it is preferred to apply the up and down movement of two inverted chambers in receivers filled with water.

[Printed, 1s. Drawings.]

A.D. 1863, June 24.—N° 1592.

MYERS, EDWARD, and WILLIAMS, WILLIAM RICHARD.—"Improvements in wet gas meters." This is said to relate "to

" a peculiar construction whereby an invariable water level is
" maintained in wet gas meters to compensate for loss of water in
" the meter." There is a drum case with a reservoir, the water
line of which is near the top, near the outlet tube is the com-
partment containing the air tube and the overflow tube, and this
compartment has a direct communication with the measuring
compartment; the air tube is placed a little below the water line
so as to effect a seal between the reservoir and the meter or
measuring chamber. The overflow tube and the air tube are
connected together, and a screw in the upper part of the drum
case is " connected with the air tube and overflow tube for the
" purpose of elevating or lowering the air tube and overflow tube
" for the purpose of registering or determining the capacity of
" the meter from the exterior, and when adjusted is secured by a
" seal or otherwise. The least loss or deviation of level of water
" in the drum case or measuring chamber allows air or gas to
" ascend the air tube into the reservoir," and causes the water
to pass from the reservoir through an orifice into the drum case
or measuring chamber until the water reveals the air tube. At
the inlet tube is a valve and valve box, a float is connected to the
valve rod which passes through a tube. The gas enters by
the inlet pipe passes through the valve, and by a tube is carried
into the lower compartment, from thence it ascends by a tube into
the drum or measuring chamber, and through an aperture into
the compartment containing the air tube, and out of the meter by
a pipe. At the bottom of the meter is a waste water plug, and
the overflow pipe descends into a compartment full of water, so as
to prevent the gas ascending the overflow tube.

[Printed, 1s. Drawings.]

A.D. 1863, July 2.—N^o 1645.

SHEDLOCK, JAMES JOHN.—"Improvements in wet gas
" meters."

These are as follows:—"In order that a wet gas meter may be
" made to register correctly by keeping the water in the case at
" an uniform level," placing "in the interior of the case of the
" meter a box containing the quantity of water necessary to com-
" pensate for loss by evaporation or otherwise." "Upon the
" under side of the water box is fixed a pipe closed at the bottom
" having in any convenient part a small hole or orifice, the size

“ of which is regulated so as to pass the required quantity of the water.” “ A second and smaller pipe open at both ends, and having communication with the exterior case is made to pass through the box, and is enclosed in and descends to within a short distance of the bottom of the larger pipe. At the highest part of the box an opening is formed by means of a pipe, or it may be a partition in the box, this pipe or partition forms a communication between the interior of the box and the meter. The bottom opening of the partition or pipe being cut off to the required level of the water in the meter.” “ When the water in the case falls below its proper level the opening at the bottom of the water box communicating with the interior becomes unsealed, and consequently the gas in the meter passes through the opening into the box, displacing the quantity of water required to bring the water level to its proper height when the opening in the pipe or partition will be closed preventing the further entrance of the gas into the box.”

[Printed, *8d.* Drawing.]

A.D. 1863, July 2.—N^o 1647.

CROLL, ALEXANDER ANGUS.—“ Improvements in the preparation of materials to be used in the purification of gas.” These are “ the combining the neutral salts referred to (or as nearly neutral as convenient) with wood sawdust, or other slightly absorbent or cellular matter, and employing such mixture in purifying apparatus for the purification of gas,” as follows. The salts employed “ are the sulphate of alumina, the chloride or sulphate of zinc, or the chloride or sulphate of manganese, or the chloride or sulphate of iron.” In preference employing sulphate of alumina, “ sp. gr. about 90° (Twaddle), and as nearly neutral as it can be conveniently obtained in the process of manufacture, and at a temperature of about 230° (Fahrenheit),” combining it in preference “ with wood, sawdust, and in the proportion of about five parts by weight of such alumina with one part of weight of dry wood sawdust.” When employing chloride or sulphate of manganese evaporating to sp. gr. “ about 123° (Twaddle),” and temperature about 230° F., mixing as above, and in preference, adding a small quantity of pounded chalk to the manganese previous to its admixture with the sawdust. These combinations are allowed to cool, and are used in

dry lime purifiers. A mixture may be obtained by combining at a temperature of "about 230° F. seven parts by weight of sulphuric acid (containing 80 per cent. of oil of vitrol), six parts " of finely divided and roasted China clay, and two parts of dry " wood sawdust," but the proportions may be varied. When employing salts of zinc or iron the neutrality of such salts may readily be obtained by the introduction of metallic zinc or turnings or other reduced portions of iron, as the case may be, to the solutions.

[Printed, 4d. No Drawings.]

A.D. 1863, July 3.—N° 1657.

BRIMSMEAD, HENRY. — "Improvements in cooking apparatus," more especially, but not exclusively, suitable to be heated by gas. It consists of an oven, on either side of which are one or two detachable boilers heated by closed tubes "projecting from " the boilers into the lower compartment of the oven " above the gas burners. A "heat distributor," in the form of an inverted cone, turns the heat from the burners beneath it to the sides of the oven. Above the boilers are folding leaves for receiving dishes. The amount of heat required is regulated by shifting the burners laterally to or from the tubes. Burners outside the oven are employed to heat the boilers when the oven is not in use.

[Printed, 10d. Drawing.]

A.D. 1863, July 6.—N° 1673.

SAMUEL, JAMES.—(*Provisional protection only.*)—"Improvements in manufacturing gas for lighting and heating purposes, " and in apparatus connected therewith." These are forming a rectangular, circular, or other form of cistern for holding a liquid hydrocarbon and connecting to it a regulating chamber or receptacle in which is "a float with a conical spindle valve attached to " its centre; this valve opens and closes the inlet aperture as the " float rises and falls, admitting the liquid from the cistern to the " regulating chamber," "the liquid is conducted by a pipe from " the regulating chamber to a well or receptacle considerably below " the bottom of the red-hot retort to which the well or receptacle " is attached. The heat from the retort and the fire acting upon " the liquid in the well under and attached to the retort generates " vapour, which vapour rises and passes through the retort and

" becomes decomposed into a permanent gas." "The gas may
" be washed by passing it through water or other liquid, or the
" gas may pass direct from the retorts to two gas regulators,
" and then to the burners for consumption. The first gas
" regulator regulates the pressure in the retort, and is formed like
" a small gas holder made to hold one foot or more of gas, and
" is so constructed, that, as it fills with gas, the top of the holder
" receives more weight, and it gradually increases the pressure
" in the retort, driving the liquid further away from the red-hot
" part of the retort, thus making less gas; as the top of the
" holder falls the pressure decreases, consequently the liquid
" runs higher and the retort and more gas is generated. The
" second gas regulator is of the usual description for regulating
" the pressure of gas to burners; by this arrangement a large
" gas-holder may be dispensed with." The gas generated by this
process may be increased in its illuminating power by passing it
through volatile hydrocarbon oils, the vessels holding such oils
placed near the burners also "receive any condensed vapour that
" may form in the gas pipes."

[Printed, 4d. No Drawings.]

A.D. 1863, July 8.—N^o 1693.

BASFORD, WILLIAM.—"Improvements in apparatus for gene-
" rating and purifying gas made from coal or other bituminous
" substances." These are "making the generating apparatus in
" the form of a double retort, having two chambers placed side
" by side and communicating at the back. The front ends of
" the chambers are opened and fitted with lids; over the mouths
" of the said chambers apertures are made for the exit of the gas
" into a vessel fixed over them" and "enclosing a web, valve, or
" flap which is made to lay or fit over either of the apertures"
when worked by a crank handle fitted outside the receiver. "The
" valves are made to act alternately, and all the gas and vapours
" evolved in the retorts are made to pass through them into the
" vessel over, after having by a circuitous rout passed over the
" incandescent coke contained in the chambers." "A connecting
" pipe attached to the vessel last described conveys away the gas
" and vapours to a long vessel containing charcoal and coke,
" a longitudinal grating being fixed therein upon which the
" charcoal and coke is laid," and "a small quantity of charcoal

" and coke is also laid in the lower part of the vessel, but left sufficiently clear to receive the gas and vapours." "An outlet pipe is fixed over the top or at the further end of the said long vessel to carry away the gas after it has passed through the charcoal and coke to a chest or cistern containing water mixed with lime, through which the gas passes," and is "conveyed away to a vessel of the ordinary description containing dry lime, through which the gas passes, and is conducted by pipes or mains in the usual manner to the holder."

[Printed, 10d. Drawing.]

A.D. 1863, July 13.—N° 1749.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Eugene Frederic Piat and Theodore Auguste Baudrit.*)—"Improvements in apparatus for suspending chandeliers, gaseliers, and other weights." These are "combining one or more fusees or grooved pullies with one or more spring barrels." The apparatus is modified to suit different applications, but in all, the feature is the same, that is to say, the invention is based upon the compensation of the power of a spring by the greater or less radius of a fusee which turns the barrel, or the regulation of two springs of unequal power, the one by the other. The arrangement of the parts depends upon the manner in which the apparatus is to be used, that is to say, there may be a single fusee and one spring, or there may be double or coupled fusees with two springs. When applied to support gas burners, caoutchouc tubes for conveying the gas may be substituted for part of the cords or chains connecting the apparatus with the burner to be supported.

[Printed, 1s. Drawings.]

A.D. 1863, July 17.—N° 1798.

ALCAN, EMILE.—(*A communication from Adolph Bay.*)—(*Provisional protection only.*)—"An improvement in gas burners." This "relates to those burners in which two currents of gas are made to unite at the top of the burner and on being lighted by a fan like flame," and "consists in forming four conduits, and in bringing together four currents of gas at the top of the burner, whereby an increased light is obtained from a given

" quantity of gas, while at the same time the light is more steady
" than that obtained by any burner."

[Printed, 4d. No Drawings.]

A.D. 1863, July 23.—N° 1843.

SOUL, MATTHEW AUGUSTUS.—(*A communication from John Palmer.*)—"Improvements in expelling solid and liquid refuse
" matter from steam and sailing ships below the water line,
" applicable also for discharging cannon below water from ships
" and forts, and in part for charging gas retorts and iron furnaces,
" and for other similar useful purposes." These are, in reference
to this subject, in attaching on the top of a gas retort a receptacle
for "the charging material," at the bottom of which is a valve
communicating with the retort; on the top of the receptacle con-
taining the charging material is an "external cover shutting off
" communication when the charged material is ejected or let
" fall into the furnace or retort." The remainder of the specifi-
cation has reference to the other matters named in the title of the
invention.

[Printed, 1s. Drawing.]

A.D. 1863, August 6.—N° 1946.

KIRKHAM, JOHN.—"Improved apparatus for generating heat
" for smelting and other purposes." In "adapting the invention
" to the smelting of iron" there is arranged "on either side of a
" reverberatory furnace" "a gas generating furnace" connected
with it "by suitable flues. These gas generators are fitted at top
" with a closed hopper for holding coal or other fuel to be sup-
" plied to the generators." "When the generating furnaces are
" charged with fuel, fire is to be applied at the bottom, the door
" giving access thereto being left open." A "conical valve at
" the lower end of the hopper and the door on its mouth-piece at
" top are also to be open until the fuel is well ignited; the fur-
" naces are then to be closed. The draft is now to be kept up by
" hot atmospheric air forced in near the top of the generating
" furnace by blowing apparatus. The air descends through the
" fuel for the support of the combustion," "and the gases gene-
" rated pass off into the reverberatory furnace." "Small jets of
" steam are introduced into the incandescent fuel." "The
" streams of gases as they pass to the middle or smelting furnace

"have introduced to them a further supply of hot atmospheric air and hydrogen gas, previously prepared and forced into the passages from the gas generating furnaces." "In the flue at the rear of the furnace," are "set up a series of retorts for generating gas, applying for that purpose the heat that passes off from the smelting furnace." The retorts are "set transversely across the flue, and" "the gas derived therefrom" is led to the gas furnaces. In the rear of "the retorts is an oblong air chamber in which are laid a number of tubes, which tubes lead the hot gases through the chamber. Air is caused to circulate around these tubes." "The heated gases, after passing through the horizontal tubes in the air chamber, serve to generate steam in a tubular boiler set in rear of the air chamber, and the steam thus generated may be used for supplying the gas furnaces with jets of steam as described, or for supplying the retorts when water gas is made therein."

"The same principle of arrangement of furnaces may, with modification of details, be applied for heating steam boilers and large stoves for providing hot air blasts."

[Printed, 1s. 10d. Drawings.]

A.D. 1863, August 7.—N° 1950.

MULHOLLAND, FREDERICK GEORGE.—(*Provisional protection only.*)—"Improvements in pipe castings for gas, water, sanitary, and other general purposes, and the introduction of an elastic chemical compound to form expansive joints thereto for prevention of leakage." These are as follows,—the pipes are "cast straight and of uniform diameter throughout (the ordinary enlargement for jointing being dispensed with, and in lieu thereof a collar run loose into position over each junction). The pipes are tapered or halved into each other (in the thickness of the metal only) at either end, so that when laid each pipe overlaps its neighbour, and in case of expansion or contraction, there is always ample room for play in the junction without reducing the diameter or strength of the pipe ends." Over each junction is passed "a hollow collar rimmed (singly or doubly) inside to retain the elastic composition in position when required, and through a cap or orifice therein" the compound is poured in a fluid or semifluid state. The compound referred to above is "ordinarily and preferentially prepared" of "the following

“ materials in varying proportions to suit the climatic temperature
 “ of the countries or localities wherein pipe-laying works are to
 “ be executed, viz. :—

“ For low temperatures and for high temperatures—

| | | | | |
|---------------------------|------|------|------|-------------|
| “ Vulcanized india-rubber | 60·0 | to | 80·0 | per centum. |
| “ Resin and tallow | - | 35·0 | „ | 10·0 „ |
| “ Shoddy or fluff - | - | 3·5 | „ | 7·5 „ |
| “ Prepared phosphorous - | - | 1·5 | „ | 2·5 „ |

| | |
|---------|-------|
| “ 100·0 | 100·0 |
|---------|-------|

“ or ” introducing and using “ other compounds or compositions
 “ having similar elastic and preservative properties.” The in-
 gredients are exposed in a vessel for 4 to 5 hours to a temperature
 of from 260° to 290° F., and when thoroughly incorporated and
 slightly cooled “ the prepared phosphorous ” is added.

[Printed, 4*cl.* No Drawings.]

A.D. 1863, August 11.—N° 1978.

KING, JOHN THOMSON. — “ Improvements in apparatus for
 “ containing and distributing gas for lighting railway carriages,
 “ steamboats, and other moveable vehicles and vessels, railway
 “ stations and other places, parts of such apparatus being suitable
 “ for governing the supply of gas and air for various purposes.”
 These are, employing a dry gas container or holder suitable in
 shape to the position in which it is to be placed, and attaching
 to it in any convenient way a flexible diaphragm, so that by the
 weight thereof and the pressure of the atmosphere, gas supplied
 to the holder from street mains or other pipes at ordinary pres-
 sures shall be forced out in sufficient quantity to supply the
 burners. In preference, the holder is closed at the top. Near to
 the closed holder the flexible diaphragm is secured between flanges,
 or otherwise, and the flexible diaphragm is so formed that “ when
 “ it is distended upwards or downwards it will fit close to the
 “ inner surface of the container or holder. The gas is contained
 “ on one side of the diaphragm, and on the same side are secured
 “ the ingress pipes for receiving the gas as required, say, through
 “ flexible tubing, and the egress pipes for carrying it to the
 “ burners.” On the other side of the diaphragm there is an
 opening in the holder to allow air to enter, or a pipe or pipes to
 convey air thereinto. To supply gas steadily to the burners or

jets in railway carriages, &c., the flexible diaphragm "should be
" as light as possible," and "it should have a pressure of air
" over one side thereof sufficient to force out from the other side
" the quantity of gas necessary for the burners lit." To give
this pressure, employing "a gas meter, preferably that known as
" Thomas Glover's patent dry gas meter, driven by clockwork of
" any suitable description. The index of the meter will show
" the quantity of air being passed into the container or holder on
" the one side of the diaphragm, and as an equivalent quantity
" of gas would be distributed to the burners from the other side
" of the diaphragm, care should be taken to adjust the meter and
" clock-work so as to give an economical pressure. A fan or other
" engine driven by clockwork could be used for the same pur-
" pose, and the meter and clockwork, or other engine could be
" employed to draw the gas from the container or holder and
" pass it forward to the burners." This meter driven by clock-
work is "suitable for forcing or drawing a current of air through
" an apparatus containing a volatile hydrocarbon liquid, for the
" purpose of obtaining an illuminating agent," and "might also
" be used for forcing or drawing air or gas in any given quantity
" for maintaining and supplying the means of combustion, or for
" forcing or drawing air or gas into or from different places, and
" for many other purposes."

[Printed, 10d. Drawing.]

A.D. 1863, August 21.—N^o 2074.

HILL, JAMES FRANCE.—(*Provisional protection only.*)—"An
" improved ventilating gas lamp or gasalier." This consists,
first, fixing "in the ceiling a perforated plate of any desirable
" design, size, or pattern, to the upper part of which" is attached
a tube to form an air flue, and this is made "to terminate in an
" adjacent chimney or other suitable and convenient outlet to the
" open air." From the centre of this plate is suspended "two
" tubes of different diameters one within the other, the inner one
" being the gas tube terminating in the burner, the outer one the
" ventilating tube terminating at a suitable distance above it to
" receive the products of combustion and carry them up into the
" air shaft, with which its upper end is in communication. The
" outer tube is made of a sufficient diameter to answer this
" purpose." Over the burner, and supported by the tube or

tubes, is fixed "an opal or glass cover or shade in such a manner
" as to allow of no opening at the top, excepting one into the
" ventilating tube. This shade surrounds the light in all
" directions, excepting at the bottom." Underneath the open
bottom is fixed "a dish or plate of glass or any other suitable
" transparent or semi-transparent material in such a manner as
" to be capable of being raised to a point sufficiently near the
" top of the glass to prevent the flame within from being directly
" seen, and lowered to such an extent as to admit air to the
" burner, and to answer as a door for obtaining access to the
" interior of the lamp for lighting, cleaning, or other purposes."
" In arranging such lamps in groups of two or more, as well as
" in adapting single lamps under varying circumstances, modifi-
" cations of these details will become necessary, but the principle
" of construction of each lamp will in all cases be the same."

[Printed, 4d. No Drawings.]

A.D. 1863, August 26.—N° 2102.

FRIEND, JOHN WALTER.—"Improvements in the construction
" of gas meters, and in apparatus to be employed in connection
" therewith for regulating the pressure and flow of gas to the
" same." These are, "the general construction and arrangement
" of the several parts in connection with the employment of
" dry fluid packings of mercury for sealing the inverted hollow
" piston or measuring partition in gas meters, together with the
" gravitating lever, four-way top, and alternating stud motion,
" in conjunction with the conical valve regulator," as follows,
employing "in lieu of the ordinary measuring drum or cham-
" ber a vessel of a cylindrical form mounted vertically upon a
" suitable stand or base, in which an inverted hollow vessel or
" piston is fitted, and caused to work freely within the same, and
" admit of its being actuated by the pressure of the gas in its
" passage through the meter, the said piston being packed with
" mercury and provided with a piston rod passing through a
" stuffing box on the top or cover of the cylinder, to which are
" affixed two vertical plates arranged parallel to each other
" carrying an horizontal spindle which receives motion through
" the medium of toothed wheels, balance weight, and pulley gear
" direct from the piston top, a four-way top being employed in
" connection therewith, as also a small gravitating lever and

“ alternating stop stud motion, by the raising and falling of which
“ the plug of the top is carried round to the quarter port, and
“ again on the reverse side in like manner at each up-and-down
“ stroke of the piston, whereby the gas is admitted and regulated
“ to the meter, and the indicators set in motion.”

[Printed, &c. Drawing.]

A.D. 1863, September 1.—N^o 2162.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from William Elmer.*)—“ Improvements in the manufacture of illuminating gas.” These are, first, “transmuting into illuminating gas the liquid products obtained in the gas manufacture, by decomposing them by heat in the presence of the light carbides of hydrogen or hydrogen given off by the gas stock during the latter part of its distillation.”

Second, “transmuting liquid hydrocarbons into acetylenè, by decomposing them at a high temperature in the presence of heated hydrogen produced by the decomposition of water.”

Third, “transmuting deposited carbon into acetylenè, by subjecting it to a high temperature in the presence of heated hydrogen produced by the decomposition of water.”

In carrying out the above the ordinary apparatus employed in making gas is used, and the following additions are made thereto:—1st, a vat is provided above the level of the retort to contain the liquid products to be used; 2nd, a feed pipe is applied to each retort for the purpose of supplying the liquid products from the vat thereto, and the feed pipe is provided with a valve or conical screw rod (such as is well known in the manufacture of rosin gas) to regulate the supply; 3rd, a steam boiler with a pipe into each retort; 4th, a portion of the discharge pipe of glass and of a globular shape to show the presence of water, if any, escape decomposition; 5th, a small gas pipe with burner and stop cock from each retort to test the quality of the gas during the operation. The retort is charged with coal, and the heat is regulated to produce the largest amount of olefiant gas, the liquid products are carefully collected in a cistern and are pumped into the vat and gradually fed into the retort. To utilize all the liquid products and the solid carbon deposited in the retorts, a quantity of metallic zinc or of an equivalent matter for decomposing steam is charged into the retort, steam is passed

into the retort and the process continued until the deposited carbon has been utilized.

[Printed, 6d. No Drawings.]

A.D. 1863, September 5.—No 2187.

LORBERG, WILLIAM.—“Improvements in the manufacture of gas and other substances from tan and similar materials.”
“These are in the mode of carbonization as follows:—Employing the usual D-shaped retort about sixteen feet long, and open at both ends,” which openings are named “A and B, the exit pipe being at B.” A charge of raw material either alone or mixed with tar as described in No. 650, A.D. 1861, is introduced at A, and when this charge is about half carbonized the lid is opened at A, and by means of a kind of partition or slide loosely fitting into the interior of the retort, the mass of charcoal and undecomposed matter is pushed forward “towards B, so as to leave empty about two-thirds of the length of the retort from A, and introduce a fresh charge of raw material. By the time that this charge is half done and ready to be moved forward, the former charge will be carbonized and the charcoal is withdrawn at B, while another charge of raw material is introduced at A, and so on continuously, the object being always to have two charges in the retort in different stages of carbonization.”
“When the gas is to be used for illumination it should be passed through lime or caustic alkali in order to free it from the admixture of carbonic acid. The other products of the process as charcoal, tar, acetic acid, ammonia, naphtha” are treated and utilized in the usual manner.

[Printed, 4d. No Drawings.]

A.D. 1863, September 17.—No 2278.

MERCIER, ZACHARIE JOSEPH.—(*Provisional protection only.*)
—“An improved gas cock of elastic and continuous pressure.”
This consists as follows:—This “cock is composed of the barrel which is pierced with a conical hole called the seal of the plug entering the seat and serving to open or shut the cock according to the direction in which it is turned. One of the ends of the plug carries a balance lever, so that the cock may be opened and shut, using a rod and stick, and the lighter of a street lamp will require no ladder.” “The other end of the

" plug, and it is this that forms the main feature" of the invention, " passes about an inch beyond the seat, this part, near the seat, and for about $\frac{1}{4}$ of an inch is square, but the continuation is cylindrical, the square part receives a washer, and on the cylindrical extension is placed a spiral spring. By means of a jacket or cap which is placed over and firmly screwed to the end of the extension, the said spiral spring presses against the washer and tends always to draw the plug in the direction opposed to the balanced lever, and this constitutes an elastic and continuous pressure always equal."

[Printed, *sd.* No Drawings.]

A.D. 1863, September 18.—N^o 2290.

ALLEN, JAMES.—" Improvements in the construction of valves and cocks for steam, water, gas, and other fluids."

" The first part of my invention consists in placing the screw for working the valve or cock at the bottom of the spindle and below the seating, thus bringing the screw close to the valve."

" Secondly, in the application of two valves, one on each side of the seating, and facing each other; the upper valve is worked by a screw in the stuffing box, and the other is furnished with a screw passing into the spindle of the first, or the spindle of the first valve may screw into the second. By turning one of the valves round both valves are brought towards each other against the seating to close the orifice, or they are separated from each other to open it."

" And, thirdly, in the application of cupped leathers or other suitable substances to valves or cocks having recessed seatings to receive them; the cupped valve is placed on the pressure side of the seating, so that when the valve is closed the pressure of the water or other fluid expands the leather or other substance."

[Printed, *sd.* Drawings.]

A.D. 1863, September 18.—N^o 2294.

LORBERG, WILLIAM.—" Improvements in the treatment of rags and obtaining valuable chemical products from the animal fibre therein." These are, in reference to this subject, as follows:—Mixed fabrics in rags containing vegetable and animal fibre "known in the trade as lindseys, stuffs, bodies, shallies,

“ seams, and the like ” are steeped or digested “ in a solution of
“ caustic alkali, soda, or potash of from 2° to 15° Baumé, which
“ completely dissolves out the animal fibre, whether wool, silk,
“ or hair, and leaves the vegetable fibre intact. The operation
“ takes place in the cold, but heat accelerates it.” It is preferred
to heat it just below the boiling point of the liquid, using a closed
vessel with a condensor, so as to collect the whole of the
ammoniacal vapours evolved. The goods are subjected to pressure
and the liquor collected, and the goods washed and bleached.
This alkaline liquid containing the component parts of “ the
“ wool, silk, hair, or other animal fibres ” is very rich in nitrogen.
For manure it may be used in the liquid state, or, for the sake
of convenience, boiled down to dryness. If ammonia is required
the syrupy mass is mixed with lime previous to distillation. If
cyanogen compounds are preferred to ammonia, soda ash or
pearl ash are added, and the whole distilled as above, collecting
any ammonia usually evolved. “ The illuminating gas evolved
“ during the process, and which is of very good quality, may be
“ utilized for lighting purposes or burnt in the furnace.”

[Printed, 4d. No Drawings.]

A.D. 1863, September 23.—No 2344.

HUGHES, EDWARD THOMAS.—(*A communication from John Brunt and Alexander Renaux.*)—(*Provisional protection only.*)—

“ Improvements in gas condensers.” These are as follows:—

“ The condensor is composed in the abstract of two constitutive
“ parts, the one consisting in a series of tubes, and the other in
“ a jacket or cylinder enveloping the same; these two parts are
“ united by head plates, so that they can be traversed by two
“ separate currents of gas or air having no immediate connection
“ with each other, one of the said currents being made to pass
“ through the tubes whilst the other circulates in the space
“ existing between the exterior of the tubes and the inside of the
“ jacket.” “ One or other of these two passages can be used
“ either for the gas or the air, and the gas being introduced at
“ an opening into one extremity of the jacket, flows out at the
“ opposite extremity, whilst the air entering freely through the
“ base of the apparatus into the tubes which are not occupied by
“ the gas becomes gradually charged with the caloric abandoned
“ by the gas, and consequently rises in a constant and rapid

" current, which can be increased if necessary by the addition of
 " a chimney. When desirable, this natural draught is replaced
 " either by forcing a current of air in the apparatus at its base,
 " or by applying suction to its upper extremity, and thereby
 " exhausting rapidly the air from the apparatus, creating an
 " artificial draught which can be increased or diminished at
 " liberty."

[Printed, 4d. No Drawings.]

A.D. 1863, September 26.—N° 2372.

GLEERUP, ABRAHAM.—(*A communication from Otto Frederick Kolvig Peterson.*)—(*Provisional protection only.*)—"An improved
 " construction of gas burner." This consists "of two burners
 " set one above the other, and combined in such manner that the
 " supply of gas to the upper will be regulated by the lower
 " burner," as follows:—"Above an ordinary burner pierced, say
 " with diagonal holes of a given capacity, is placed a tube fitted
 " with a gas burner top, having, say three, saw cut orifices of
 " superior capacity to the orifices of the lower or covered burner,
 " and with the side cuts inclining so as to cross the jets of flame
 " when the gas is burning. The gas supply chamber thus formed
 " between the two burners ensures the regulation of the supply
 " to the upper burner, and the crossing of the jets enables the
 " air to enter the flame, so as to ensure a more complete com-
 " bustion of the gas than has heretofore been obtained."

[Printed, 4d. No Drawings.]

A.D. 1863, September 26.—N° 2374.

MALAM, WILLIAM, and TICE, WILLIAM.—"Improvements in
 " apparatus for supplying gas to railway carriages and other
 " moving structures, and in apparatus for manufacturing and
 " holding gas in ships and other vessels, parts of such apparatus
 " being also applicable for manufacturing and holding gas else-
 " where." These are, first, "the apparatus for supplying gas to
 " railway carriages and other moving structures, in so far as
 " regards the employment of a pipe or series of pipes acting as a
 " reservoir or holder, and combined with a chamber for expan-
 " sion, a spring valve, or other like controlling appliance, and a
 " regulator," so that the "gas may be supplied and stored at
 " high pressure, and delivered for consumption at reduced or low
 " pressure."

Second, the diaphragm "regulator in so far as regards the employment of a spring or springs in combination with the diaphragm and cone valves."

Third, the employment of a compensation regulator, arranged in combination with the reservoir or holder pipe or pipes, and chamber for expansion for reducing the pressure of the gas."

Fourth, "the employment in a retort of a passage or tubular way, leading from the front towards the back, and forming the communication between the interior of the retort and the ascension pipe," so that the gas generated in the retort is forced to pass into and through the said passage before escaping into the ascension pipe and "tarry or other impurities are prevented from falling to the bottom of the mouthpiece."

Fifth, "constructing a hydraulic main with recesses or chambers at its bottom or under part to receive the ends or pipes." The pipes dip and open into these recesses by which the lower ends are kept submerged, and the tarry, &c. matters retained, and kept out of the body of the main even when the vessel rolls or lurches."

Sixth, "the employment of racks and teeth catches or clicks for steadying the cylinder of a gas holder in its descent."

Seventh, "the arrangement and combination of a lever and crank rods with racks, collars, and teeth catches or clicks."

Eighth, "the employment in apparatus for holding gas of a fan, screw, or wheel in the passage or thoroughfare through which the gas flows from the holder to be consumed." The fan works in a chamber and driven by clockwork or other power, draws and delivers the gas regularly. Instead of a fan a screw or wheel may be fitted in the box or chamber.

Ninth, a gas holder "in which a flexible vessel is combined with a close or air-tight casing or chamber, fitted with a pipe for carrying off escapes or noxious emanations."

[Printed, 1s. 2d. Drawings.]

A.D. 1863, September 23,—No 2383.

BAILEY, JOHN, BLAKE, GEORGE WILLIAM, and BAILEY, WILLIAM HENRY.—"Improvements in barometers, gas regulators, and other apparatuses for regulating and indicating the flow and pressure of liquids and fluids." These are, in reference to this subject, as follows:—First, "the application of the

principle of "Bourdon's gauge to the weight gauge" described in No. 3058, A.D. 1861.

Second, constructing dial pressure gauges used for indicating low pressures, such as gas and air, by making the casing of these gauges "in three principal parts which can easily be cast. The "reservoir at the bottom for containing the water, the ascension "pipe for the float made of tin, which serves also for a guide for "the float, and screws on the reservoir, and the dial case fixed "on the top of the ascension tube."

Third, in constructing gas regulators, the gas passes upwards to the interior of the regulator, through a pipe, which communicates with a small chamber, and makes its exit through a square shaped hole at the top of the said chamber; between the inlet and exit holes a small globe of some light and uncorrosive material, such as wood pith or other like substance, is placed, which rises and falls according to the pressure of the gas, "the globe "when resting against the square hole leaves sufficient space for "a small quantity of gas to pass." A burner constructed somewhat similar can be made to serve as a pipe or cigar light. Inside the regulating chamber a metal ball is placed, which almost closes the bottom orifice or outlet for the gas when the burner is held perpendicular, but if inclined ever so slightly in any direction, the ball rolls aside and leaves the passage nearly if not totally free. "The amount of clearance may be regulated by a screw. "The lighting of church clocks may be done in a similar manner, "but in this case the ball is controlled by clockwork that is "brought over the outlet during the day," and "rolled on one "side during the night when the full light is required."

[Printed, 1s. 2d. Drawings.]

A.D. 1863, October 5.—N^o 2432.

TOMLINSON, CHARLES.—(*Provisional protection only.*)—"Improvements in taps, cocks, hydrants, or valves, and apparatus "connected therewith, for opening, closing, regulating, and "facilitating, and otherwise controlling the passage or flow of "water, air, steam, gas, and other fluids and liquids." The principal points that refer to the flow of gas are:—A tap opens and closes by the motion of a valve or plug, which is governed by a conical ended stem being screwed on to the valve, so that the valve is opened or closed by the movement of the stem. A

second valve may be added to the aforesaid tap, or the other side of the first valve may act as a second valve; the second valve enables the tap to be repaired without shutting off the pressure. In one method either side of a bell cranked valve forms a valve. In another plan, each side of a flange on the stem of the cock forms a valve. In another arrangement a globular valve is inserted in the induction portion of the cock, the valve sits on the induction side of a double sided seating, the stem is fixed to another valve on the eduction side of the seating, the said stem having a projection which may push back the induction valve, when repairs are required. Another method is to have two valves (inlet and outlet) on each end of a lever, the stem being applied to either end of the lever and used as described above. Another mode is to have a flap valve, the induction side of which may stop the flow for repairs. In another form a valve in the induction part of the cock acts by its stem on a second valve, which regulates the outlet orifice. In another application, a ball valve has a screwed spindle at one side, which opens, closes, or regulates the passage. Spindle valves are used in connexion with a flange pipe, so that they bear either against an upper or lower washer. Other modifications of the above are set forth, also special arrangements for hydrants, stand posts, &c.

[Printed, 4d. No Drawings.]

A.D. 1863, October 8.—N^o 2467.

LORBERG, WILLIAM.—“Improvements in the manufacture of “gas from tar.” These are “in the manufacture of illuminating “gas and accessory products from tar in ordinary gas retorts by “mixing the tar with lime,” as follows:—The tar is mixed “with lime in sufficient quantity to form a plastic nearly solid “mass,” which is “cut into lumps and cakes,” and introduced into gas “retorts at the usual temperature of gas retorts.” Equal weights of tar and lime, that is to say, about twelve pounds of lime to the gallon of tar answers the purpose, but an excess of lime is desirable. “Ordinary slaked lime in the shape of powder “offers some advantages, for the sake of economy however,” “waste lime, such as the waste luting of gas works, soap ash, “and more particularly the lime grounds of tan yards” is used. “These lime grounds, containing a large proportion of hair and “other animal matter, produce a very good gas, and much

" ammonia, if distilled alone." "The tar is oily, and very rich in ammonia; it is well adapted for the distillation of oils, ammonia, and naphtha."

[Printed, 4d. No Drawings.]

A.D. 1863, October 10.—N° 2487.

RUTHARDT, JULIUS, and THIELE, FERDINAND.—(*Provisional protection only.*)—"Improvements in apparatus for purifying and increasing the illuminating power of gas." These are the unpurified gas from the gasometer is conveyed by a pipe into "a box or chamber made by preference of zinc or tin," and "formed into compartments by a series of perforated partitions, through which the gas passes into the several compartments in its way to the outlet pipe. A frame or frames is or are arranged in the interior of the chamber for holding or supporting wool or other fibrous materials which is employed for absorbing a rectified spirit or fluid (by preference, naphtha distilled from petroleum), supplied thereto from a suitable reservoir in connection with the apparatus. The gas in its passage through the apparatus containing the wool or other fibrous material saturated as before described, is deprived of most of its impurities, and by the evaporation of the spirit the gas in its passage to the outlet combines therewith, and thus increases the illuminating power thereof when ignited."

[Printed, 4d. No Drawings.]

A.D. 1863, October 20.—N° 2562.

MORLEY, CORNELIUS THOMAS.—(*Provisional protection only.*)—"Causing a more complete combination of gas in using it for lighting purposes." This consists in having two burners with a chamber between, with metallic gauze placed transversely "for the purpose of retarding its (the gases) passage, and to cause its contact with the heat of the chamber derived from the burning of the gas above it." "The object of the whole is to cause a more complete combustion of the gas by bringing it more fully into contact with the oxygen of the air in burning, that it may therefore give a purer, whiter, and larger flame than can be produced by the use of any simple or single burner with an equal amount of gas in its usual state."

[Printed, 4d. No Drawings.]

A.D. 1863, October 21.—N^o 2582.

TAYLOR, NATHANIEL FORTESCUE. — "Improvements in increasing the illuminating power of coal gas, and in the means or apparatus employed therein." These are "the adaptation or combination of means and mode of regulating the supply of fluid in apparatus for effecting increase in the illuminating power of coal gas by the use of hydrocarbon fluid," as follows:—The gas is conducted into the lower part of a chamber provided with a series of horizontal partitions placed one above the other, and adapted to cause the gas in its passage from the lower part of this chamber to its outlet at the upper part to traverse the chamber between the partitions. The lower portion of the chamber and the respective partitions are formed as trays to hold hydrocarbon liquid, and the space above the trays is supplied with sponge or other fibrous matter adapted to become saturated with the volatile liquid supplied to the trays. "The hydrocarbon liquid is supplied from a reservoir above to the uppermost tray by a tube dipping below the level of the fluid in that tray, and provided with a tap or valve to cut off or limit the supply as required. An air tube is also employed to admit air, vapour, or gas freely into the upper portion or reservoir from the lower portion thereof, and by the lower edge of this pipe dipping into the upper tray to the height required for the liquid in that tray, the supply of liquid thereto will be regulated, and each succeeding tray is supplied from the one above through a trap or valve, by which the fluid is retained in the respective trays for purifying purposes and without waste, or its condition is ascertained."

[Printed, 1s. 2d. Drawings.]

A.D. 1863, October 23.—N^o 2615.

CLAES, JOSEPH.—(*A communication from Pierre Alsina.*)—(*Provisional protection only.*)—"An improved apparatus for regulating the emission of gas." This consists in placing on the delivery pipe coming from the meter "an outer casing open at the top, enclosing a smaller gasometer suspended by weights and pulleys, and connected by a small iron rod with a valve which shuts more or less the orifice of the delivery pipe as the gasometer rises and falls." When "an extra amount of pressure is on the gas, the gasometer rises, and in so doing closes more or less

“ the opening of the delivery pipe, by means of the valve connected with the cupola of the gasometer by the small rod above mentioned. A sufficient pressure is brought to bear on the gas in the gasometer by means of weights or springs placed at the top of the gasometer, the gas passes on to the burners through the supply pipe, which enters the gasometer at the bottom, as does the delivery pipe, both rising a sufficient height above the water with which the outer casing or receiver is filled, and which rises in the gasometer a certain height, an escape pipe provided with a cock carrying off the surplus water, should too much be placed in the receiver. Two cocks adapted to the supply and delivery pipes let off the condensed water.” “ The size of the apparatus differs according to the number of burners to be supplied, as does the number of weights and pullies, the pullies turn in suitable bearings fixed to the pipe introducing the gas.”

[Printed, 4d. No Drawings.]

A.D. 1863, October 24.—N^o 2626.

THOMAS, JAMES.—(*Provisional protection only.*)—“ Improve-
“ ments in gas meter indicators.” These are, placing three dials
“ in a frame “ numbered round the edge with figures 1 to 10 repre-
“ senting respectively hundreds, thousands, and tens of thousands,
“ in the usual manner. These dials are acted upon by spindles
“ fixed in their centres upon which are fixed the wheels that play
“ into each other successively. One wheel upon each spindle has
“ ten notches in its periphery, and is acted upon by another wheel
“ having a single stud projecting from its rim on the adjoining
“ spindle.” “ Action is given to the several wheels by an endless
“ screw formed on the main spindle, and made to act upon a cog
“ wheel fixed on a spindle near the end of the frame. At the
“ end of the latter spindle a snail eccentric is fixed, which works
“ a lever having a friction roller at one end to ride over the snail,
“ and a spring at the other end to keep the lever in position.”
“ At the upper end of the main spindle is fixed a drum index,
“ the edge of which is divided into four parts, and a pointer is
“ fixed on the frame to indicate the number of feet of gas that
“ has passed through the meter in a given time. At the other
“ end of the main spindle is fixed a spur wheel that is acted upon
“ by an endless screw worked by the shaft of the meter in the

"usual manner. A click hinged to the outer case drops over the spur wheel and acts against the spokes so as to prevent the wheel from going back." This apparatus is fixed in a case and attached to the meter, and covered over by an enamelled or japanned plate and glass front. Perforations are made in the plate over the upper centre figure of each dial. Two ciphers are marked on the plate and "remain stationary so as to be read off in connection with the single figure in the last dial, to indicate the number of hundreds of feet of gas that have passed through the meter. The centre dial shows thousands and the first tens of thousands. Three dials are preferred for ordinary use, but a greater or less number may be used if required."

[Printed, 4d. No Drawings.]

A.D. 1863, November 3.—N° 2716.

MACINTOSH, JOHN. — "Improvements in taps or cocks for liquids or gases." These are, "the locking of ordinary or other taps or cocks to prevent them being accidentally turned," by means of "a spring bolt or bolt or lever passing through the plug," which "either catches into a slot or recess on the barrel, or actuates a vertical spring which similarly takes into a recess or catch on the barrel." "In both modes of acting on the plug, the pressure of the finger or thumb is required either on the spring bolt or on the bolt which actuates the vertical spring, in order to release the catch from the aperture into which it fits, and this pressure can be readily applied by one and the same action that turns the T-piece of the tap or cock."

[Printed, 8d. Drawing.]

A.D. 1863, November 11.—N° 2800.

BOWDITCH, WILLIAM RENWICK. — "Improvements in apparatus used in gas lighting." These are, first, placing "one or more diaphragms of wire gauze or perforated metal in vessels used to hold hydrocarbons employed in carburetting gas, especially in vessels which are placed above the lights carburetted. These diaphragms are so placed that the hydrocarbons may be below one or more of them, and while the vapour rises freely to carburet the gas, the hydrocarbons are separated by at least one diaphragm from the pipe which conveys the gas and hydrocarbon vapour to the burner or burners." "These diaphragms

" are of service when carburetting apparatus is used in carriages or vessels," &c.

Second, "removing from gas lamps hot air and products of combustion by passing the same through tubes communicating between the box or lantern which contains the light and the external air." "These tubes act most efficiently when they are about three-quarters of an inch in diameter, three inches long, and placed at an angle of about forty degrees from the perpendicular with their mouths pointing downwards."

Third, constructing reflectors of glass made with a white enamel on one side; flint glass is preferred. "When the glass is used to form reflectors the enamelled side is placed outwards from the light, so that it may not be smoked or otherwise injured by the light." "White porcelain or milk glass, or other similar reflecting material may be used instead of the above-described enamelled glass, if a sheet of ordinary window glass be placed between it and the light," but it is preferred to use the glass enamelled on one side only.

[Printed, &c. Drawing.]

A.D. 1863, November 12.—N^o 2823.

NEWTON, WILLIAM EDWARD.—(*A communication from George Washington Thompson and John Thomas Tully.*)—"Improvements in gas burners." These are, "constructing the regulators to be applied to gas burners." In these "regulators the conical valve which controls the supply of gas to the burner is attached to a flexible diaphragm upon which the gas acts in such a manner, by rising and falling in the supply passage, as to produce a variation of the area of opening the valve in an inverse ratio to the pressure of the gas upon the diaphragm. The improvement consists in providing an air chamber which is in communication with the external atmosphere. This chamber, with its opening, is placed above the flexible diaphragm, so that the diameter of the diaphragm may be made much less than in other regulators of the same class, and the casting of a shadow by the regulator is almost entirely obviated."

[Printed, &c. Drawing.]

A.D. 1863, November 17.—N^o 2878.

COWAN, WILLIAM.—"Improvements in gas meters." These are the general arrangement and construction of wet meters and

of meter valves in which the valves work in a nearly horizontal position; also the combination of the valve and float and the application of the same "to Esson's meter," as follows:—"The gas from the main is discharged by an inlet pipe into a separate and special inlet chamber on one side of the upper part of the front chamber of the meter, such chamber being attached to and in the same plane as the measuring drum. The inner diaphragm of this inlet chamber contains on its inner side the inlet valve face upon which the inlet valve works. The aperture through the face of the valve opens into a secondary chamber formed by a diaphragm attached to the top of the chamber and descending into the water in the chamber. The regulating float is placed in the main water chamber outside the diaphragm last referred to, and it is fitted with a vertical guide on its top, passing through a horizontal slotted guide to steady its action, or it may be guided in any other convenient manner, or it may work without any special guide. The valve in the inlet chamber is attached to the upper end of a differentially curved spindle or lever, working on a fixed centre in the intermediate chamber. The lower end of this lever is carried or otherwise passed round beneath the lower end of the immersed diaphragm herein-before referred to, and it is to this curved end that the float is attached. According to this arrangement the inlet pressure of the gas does not act upon the float directly, and the float and valve action operates very delicately, whilst the connection between the float and valve is of the simplest kind. The inlet gas passes from the valve chamber down the intermediate chamber, and thence through an open descending pipe to the main float chamber; thence it passes by a suitable pipe to the measuring drum." This may be applied to the wet gas meter described in No. 1942, A.D. 1858.

[Printed, 1s. 4d. Drawings.]

A.D. 1863, November 20.—N^o 2912.

RAIT, GEORGE, and WINSBORROW, JOHN.—"Improvements in the construction of dry gas meters and in the means or apparatus employed therein." These are as follows:—"The required forms are obtained to the separate parts by mechanical means, by which accuracy in the shape and size of a number of meters of a given pattern is secured. Gauged gutters are used to

shape the tin plates. Raising the edges of the plates and bulging them is effected by dies. The metal for the inlet and outlet side tubes is cut to an egg shape and then acted upon by dies. "The holes in the valve plate for the axes communicating between the diaphragms and the valves are accurately obtained by punches acting together and in the desired relative positions." These holes act as guides to hold the valve plate in position, whilst dies cut out the places for the valves and the hole for the gas inlet. The gas passage from the under side of the valves to the outlet pipe are each stamped from single plates. "The inside chamber passage is cut and has its edges chamfered at the same operation," the under surface of the upper die being bevelled towards the cutting edge for that purpose. The arms from the axes worked by the diaphragms are stamped of a hollow form. The metal for the diaphragm disc rings is cut, and the edges thereof turned, and they are bent into a ring shape by means of an apparatus having gauges, cutting rollers, and rollers to effect the turning of the edges; another roller produces the bending into the ring form. Many details and mechanical operations are described at length, and the descriptions are illustrated by 123 figures contained in 11 sheets of drawings.

[Printed, 6s. 10d. Drawings.]

A.D. 1863, November 25.—N° 2966.

BEVAN, EDWARD.—(*Provisional protection not allowed.*)—"The manufacture and application of gasses to aid in the lighting of railway carriages, separately or conjointly, omnibusses, or other carriages, ships, steamboats, or other such like vessels, light-houses, or other places where portable gas apparatus may be required." This is said to consist "in the peculiar mode of manufacturing gases as the carriages travel, with a view to keep a regular pressure on the hydrogen gas, which is made in a generator attached under the carriage and conveyed to the receiver, from whence it is distributed to the different burners, as also in ships, steam vessels, and other places in which portable gasses are required."

[Printed, 4d. No. Drawings.]

A.D. 1863, November 26.—N° 2971.

LAMING, RICHARD.—"Improvements in preparing materials useful in the purifying of gas from sulphuretted hydrogen,

“ carbonic acid, and ammonia, and in making ammoniacal compounds.” These are said to be, first, “ preparing hydrated peroxide of iron by exposing metallic iron in small pieces to the action of carbonic acid artificially dissolved in water, whether accompanied by sulphuretted hydrogen or not, and precipitating it by the agency of atmospheric oxygen.”

Second, preparing the same oxide by “ forcing atmospheric air into a solution of iron in water impregnated with carbonic acid, whether accompanied by sulphuretted hydrogen or not.”

Third, preparing the same oxide “ by combining the sulphuretted hydrogen in the ammoniacal liquor of gas works with metallic iron in small pieces, and exposing the resulting black oxide to the air to become oxidized.”

Fourth, “ desulphurizing the ammoniacal liquors of gas works by the action of metallic iron in small pieces, with or without the simultaneous influence of atmospheric air.”

Fifth, “ desulphurizing and enriching the ammoniacal liquors of gas works by forcing into them while containing metallic iron in small pieces, or black sulphide of iron, or oxide of iron, a current of atmospheric air.”

Sixth, “ obtaining in a state of inodorous combination the ammonia.” “ The ammoniacal liquors of gas works after they have been desulphuretted, as above, or by other means or the desulphuretted liquors distilled, are mixed with a solution of muriate or sulphate of manganese,” thus forming “ insoluble carbonate of manganese and solution of muriate or sulphate of ammonia.” These compounds are separated and each subjected to a boiling heat until “ it no longer exhibits any objectionable odour;” the salt of ammonia is next decomposed by lime and the ammonia distilled off; at the same time “ the carbonate of manganese contained in a close vessel ” is decomposed by dilute muriatic or sulphuric acid, and its carbonic acid is conducted “ into the vessel containing the free ammonia,” forming a pure carbonate of ammonia.” Modifications of the above process are described.

Seventh, the use of the desulphuretted ammoniacal liquors of gas works for decomposing sulphate and muriate of lime into solutions of sulphate and muriate of ammonia, either for the manufacture of ammoniacal salts, or to be deodorized by heat, decomposed by lime, and distilled as sources of free ammonia.

[Printed, 4d. No Drawings.]

A.D. 1863, November 27.—N° 2981.

PAGE, FREDERIC.—“Improvements in furnaces and apparatus for the manufacture of volatile hydro-carbons,” partly “applied to furnaces and apparatus for the manufacture of illuminating gas.” The retorts for the coal are elliptical in cross section; they are placed across the furnace in such wise that the fire gases pass at right angles to their longitudinal axes; and they may be set inclined, so that their charging ends are highest. A false bottom or grating is placed in each retort; or the bottom is made corrugated, or also plain. In order to further protect these bottoms from the heat, the fire of the furnace is caused to act directly upon a screen, of brick, fire-clay, or of iron, passing from end to end of the retort. That portion below the retort consists of a series of arches carried on the bed of the furnace. With a number of retorts, the fire-bars are set “under the undulations caused by the near junction of two retorts;” and the fire gases, after traversing the bottom of the screens, pass over the tops of the retorts through arches in the upright walls built on the tops of the arches of the lower screen. The passages above the retorts gradually diminish in size as they approach the chimney. With fewer retorts, the fire may be placed underneath the retorts instead of at the side. The vapours evolved from the coal pass through pipes into a condensing main, shaped like “a long cone or wedge, the longest diameter” being horizontal. Circuitous pipes are fitted in this condenser, through which pipes cold water or air is allowed to circulate. A smaller supplementary condenser at a higher level condenses any vapour which may have escaped the action of the larger one. “The permanent gases pass from the supplementary condenser by pipes to be burned or otherwise disposed of.”

[Printed, 10d. Drawing.]

A.D. 1863, December 1.—N° 3015.

CLARK, WILLIAM.—(*A communication from Bernard Subra.*)—“Improvements in apparatus for lighting and heating.” These are this, “system of lighting or syphon light in which the flame is projected in a downward direction, is based on the principles of the hydraulic syphon, the arms of which are turned upwards. If the longer arm of the syphon be heated the interior air becoming rarefied rises and produces a partial vacuum, which

" the denser air of the atmosphere fills by entering the shorter arm and forms a descending current, and if at this moment a flame be lighted in the short arm it will follow the current of air and descend, while the products of combustion again rising in the long arm, will continue to supply air without intermission. The short arm is enlarged in the form of a globe or lamp, while the long arm is divided into several smaller parts forming the standard of the lamp or support for the globe, and which unite and form a chimney furnished with a suitable burner."

[Printed, 1s. 8d. Drawings.]

A.D. 1863, December 1.—No 3017.

GLOVER, GEORGE. — "Improvements in dry gas meters." These are as follows, first, "in constructing and applying the connecting rods of slide valves of dry gas meters, it is usual to employ pinching screws in slots, in order to adjust the action correctly. According to the present arrangements screw nuts are employed temporarily for retaining the pins when getting the adjustment and till after the pins have been fixed by solder." In carrying out this "a slot is attached to the valve and the lower end of the pin is placed in it in such manner as that it may be moved backwards and forwards in the slot till it is adjusted, the pin is then bound firmly to the slot by means of a temporary pinching screw, the pin is then soldered and the pinching screw removed."

Second, "the valve guides in place of being bushed with cork, as at present, are bushed with leather charred in oil, which is not liable to swell and to bind the guide wires when exposed to damp." In preference, using the thick leather known as butts; pieces cut two or three inches square are put into oil, by preference almond oil, and the heat raised till the oil boils and they are boiled for about about a quarter of an hour.

Third, "in order to prevent dry gas meters being driven backwards when the meters are tilted, stops are applied which allow the axis of the counting apparatus to move part of the stops only in one direction whether the meter be tilted or in its right position."

Fourth, "dispensing with the use of the string which is now used for binding the edge of the flexible diaphragms of leather," the edge of the leather in each case is securely held round its

" ring by means of a band," "the ends are drawn tightly towards each other by a suitable clip and screws or otherwise, the ends of the bands are soldered or otherwise permanently fixed to each other, and the clip and screws," &c. removed.

[Printed, 8d. Drawing.]

A.D. 1863, December 2.—N° 3023.

WILSON, WILLIAM.—"Improvements in generating gas for illuminating and other purposes when made by passing atmospheric air over or through volatile oils, and treating such gas and the gas made from coals or cannel, after leaving the generators, so as to improve the heating and illuminating qualities thereof, and in the apparatus for effecting the same." These are as follows :—In one modification a supply cistern containing hydrocarbon oil is placed, from this a supply pipe which runs below four generating chambers with a stop cock to regulate the supply pipe. From this supply pipe are branch pipes leading into each of the generating chambers, provided with cocks or other valves for conveying the oil to the different generators, above these generators is the main air pipe from which are branch pipes for supplying atmospheric air to the several generators, these again are provided with cocks or valves; from the generators again are branch pipes provided with cocks or valves for conveying the gas to a pipe placed above the main air pipe, from which air pipe is a pipe into the gas pipe for supplying the requisite quantity of atmospheric air to the gas after it has left the generators, the quantity being regulated by a tap. A pipe from the upper part of the gas pipe leads the gas to the burners. On a level with the generators is a small chamber into which the supply pipe opens at its outer end, a tube from this chamber carrying the surplus supply of hydrocarbon oil into a vessel below, in this tube is a smaller tube into the chamber for preventing the air becoming locked in the vessel. The supply cistern is connected with the main air pipe by means of a small air pipe provided with a cock or valve for regulating the pressure on the surface of the oil in the supply cistern. In another modification the hydrocarbon oils are passed from generator to generator by inverted syphon tubes, of which one leg is longer than the other, at the end there is a vessel for receiving the surplus oils. In this modification the supply of air is precisely the same as described above.

[Printed, 1s. Drawing.]

A.D. 1863, December 2.—N° 3029.

HOLDREGE, HENRY.—(*A communication from William Henry Gwynne.*)—"Improvements in the process and manner of making " gas for illuminating, heating, and other purposes," a part of " which may also be applied to the production of metallic oxydes." These are, first, "supplying the hydrocarbon retort with gases " illuminated from the vapor of water in a separate retort, by " passing steam superheated to about the temperature of the " incandescent decomposing material." There is a distributing box with a circulating and heating passage and perforated cover, and a superheating and distributing perforated coil or their equivalent for "superheating the vapor of water and distributing " the same in a finely divided state through the incandescent " decomposing material," which are claimed.

Second, "the decomposing of steam by passing the same through " melted metals or ores, for the purpose of obtaining the hydrogen " therefrom for illuminating or heating purposes, at the same " time producing metallic oxides."

Third, "obtaining gas for heating, lighting, and other purposes " by decomposing highly heated and finely divided jets of steam " by means of anthracite coal."

Fourth, "carbonizing gas for illuminating purposes by passing " it through a number of retorts of anthracite incandescent " coal."

Fifth, "the process of making illuminating gas by the use of " anthracite coal or other suitable materials to decompose the " vapor of water and absorb the oxygen, setting the hydrogen " free, in combination with the use of bitumenous or soft coal to " carbonize such hydrogen so obtained by the decomposition of " such water." The apparatus for this purpose, and which is claimed, consists of a retort provided with a superheating and distributing box or coil; connected with this retort is a bent syphon tube for supplying the water, this retort is filled with anthracite coal. The water is decomposed in this retort and "the " hydrogen and other gases, except the oxygen, which is taken " up by the anthracite coal" are conducted by a pipe to a retort placed underneath filled with bitumenous coal.

Sixth, "the reheating of illuminating gas after the same has been carbonized" to "improve its illuminating qualities." The gas after passing through the bitumenous coals flows through an

opening at the back of the retort and passes through a core or passage cast upon the top of the retort and which is highly heated, and from thence into a stand pipe to the coolers and purifiers.

Seventh, "introducing into a retort containing coal, wood, or " other material from which gas can be obtained a stream of " petroleum or other liquid hydrocarbon" for the purpose of producing a richer gas than is produced from the materials themselves.

Eighth, "producing illuminating gas by exhausting the products of a body of coal from a cupola or its equivalent through " a quantity of incandescent material."

Ninth, "the employment or use of a cupola surrounded by an annular space or surface in connection with an exhausting fan " or its equivalent applied and operating for producing illuminating gas."

[Printed, 1s. 2d. Drawings.]

A.D. 1863, December 2.—N^o 3033.

CUTLER, JOSEPH.—(*Provisional protection only.*)—"Improve-
ments in apparatus for lighting and ventilating." These are
"in lighting a room the apparatus is placed near the ceiling like
"what are known as 'sun lights' and the products of combustion
"are carried off" by a funnel mouthed pipe above the ceiling.
"This pipe is of iron and may, if desired, be made double."
"Beneath the funnel mouthed pipe is a convex reflector of less
"diameter than the entrance to the funnel; this reflector is of
"metal or of silvered glass. Below the convex reflector and
"ranged around it are the burners, which when gas is used, in
"preference, a ring burner is employed," having a number of
small separate jets, or the holes of the burner may be so close
together that the flames shall all unite together and form a perfect
ring of flame. Other burners may be employed. Below the
reflector and the burner is placed a globe or basin of glass, the
sides of which rise around the burner and so protect the flames
from currents of air. "The pipe that supplies the burners with
"gas passes down through the centre of the pipe that conveys
"away the heated gases from the burners; this pipe passes down
"through the centre of the reflector and through the centre of
"the glass basin below, and beneath the glass basin the lower
"end of the pipe is provided with a knob or handle, by turning

" which the tap that admits the gas to the burners may be opened
" or shut." When the apparatus is to be used as an out-door
" light then the top of the exterior glass basin above-mentioned
" is brought up to the edge of a cover of metal, or it might be of
" talc or other material, and to the centre of this cover is connected a pipe by which the products of combustion are carried
" away," and for a reflector employing "a globular mirror, and
" the ring of lights may either be placed on a level with the centre
" of the globe or it may be placed below the centre, according as
" it is desired to throw the light to a greater or less distance."
" The pipe that supplies gas to the burners is as in the former
" case."

[Printed, 4d. No Drawings.]

A.D. 1863, December 3.—N^o 3042.

HULET^T, DAVID.—"Improvements in gas stoves for heating
" irons and other purposes, and in the construction of irons to be
" heated and used therewith." These are, first, constructing
" gas stoves "so that they may present the appearance of an open
" fire of wood, coal, coke, turf, or other combustible material," as
" follows:—Using terra cotta, fire clay, metal, &c., moulded or
" shaped to represent the same, and in preference hollow, so that
" the gas may be introduced inside and allowed to ignite on the
" surface by means of small holes or apertures. The pieces may be
" arranged to suit an ordinary grate or stove and asbestos or other
" indestructible material may be attached.

Second, "the construction of irons for ironing with a flue or
" flues in them." In preference three flues are used but the
" number of flues may be varied "as well as the direction in
" which they run."

Third, "the construction and employment of self-acting valves
" or cocks" in gas stoves "so that but little gas may be consumed
" except when the stove is required for use;" by fitting
" to the supply pipe a valve or cock made self-acting." "On
" this valve or on a lever connected thereto" are placed the irons
" or other articles to be heated which, pressing on the valve or its
" lever opens the said valves and then turns on the gas. This is
" effected by a valve and a lever on the end of which is a balance
" weight, in place of which weight "a spring may be substituted if
" required."

[Printed, 6d. Drawing.]

A.D. 1863, December 4.—N° 3046.

ROBBINS, JOHN.—“Improved methods of obtaining oxygen gas.” These are “the combination and treatment of the substances” afterwards mentioned, or “their chemical equivalents or analogues” as follows, for obtaining oxygen gas. In the first place “combining peroxide of barium with bichromate of potash in the proportion of two parts by weight of the former to one part of the latter.” The compound thus formed is then placed in a glass flask, or bottle, &c. with an exit tube, and 8 parts of dilute sulphuric acid (1 part of sulphuric acid to 7 parts of water) are added to one part of the compound. “The strength and quantity of the dilute acid may be varied according as it is desired that the process shall be performed slowly or with rapidity.” The oxygen gas evolved is collected over water or mercury. “Its evolution may be accelerated by adding a small quantity of hydrochloric acid to the dilute sulphuric acid.” Peroxide of barium may be replaced by any other peroxide capable of forming peroxide of hydrogen, as for example, the peroxides of potassium, sodium, strontian, and calcium, but in consequence of the high price of those substances they are practically inapplicable.” “Again, instead of the bichromate of potash” using other “combinations of chromic acid and also manganic and permanganic acid,” also “peroxide of manganese and peroxide of lead,” but the bichromate of potash is preferred to any other substance. In place of the above acids dilute hydrochloric or nitric acid or any other acid possessing similar or equivalent properties may be employed; or the acid may be dispensed with and bisulphate of potash substituted for the same in equal proportions to the compound, adding to the mixture 7 or 8 parts of water. Another mode of obtaining oxygen gas is to heat the compound in a dry state in a retort or other suitable receptacle, “the oxygen gas will be given off, and may be collected in the usual manner.”

[Printed, *4d.* No Drawings.]

A.D. 1863, December 5.—N° 3055.

VARLEY, SAMUEL ALFRED and VARLEY, CROMWELL FLEETWOOD.—(*Provisional protection only.*)—“Improvements in heating, parts of the invention being applicable to other purposes.” These are said to be in economically heating by

" gas, conservatories, forcing houses, or other places, where equable temperature is required," &c., and are based upon their Patent, No. 2858, A.D. 1860, and in reference to this subject they are as follows, first in the regulator for regulating the flow of the gas " preventing the mixture of the spirit and mercury during carriage " either by connecting the two through a small aperture " which in preference is made " of platina or iron amalgamated, this " aperture being generally placed in the plug of a tap, or by " inserting a film of vulcanized india-rubber or other suitable " material between the mercury and the spirit." " The temperature at which the main supply of gas shall be cut off " is determined by screwing in a plunger through a stuffing box which is always below the surface of the mercury. " Through the upper " part of the valve there is an inlet and outlet passage for the " gas, the former descending lower than the outlet; the expansion " of the fluid in the bulb by the heat of the room or chamber " forces up the mercury and cuts off the gas." These passages are closed by taps during carriage.

Second, a gas burner or furnace is a cylinder or cone of perforated metal or gauze (two or more layers) or both. The lower portion stands in an iron well in which there are several gas jets; a tight joint is between the well and the lower portion of the perforated cylinder. Over a small jet employed for lighting the gas when turned on is placed " a piece of spongy platina " to relight it in case it goes out. " An important application of this invention is to astronomical clocks," to keep various parts, &c. of the clock at one or a more uniform temperature, &c.

[Printed, 4d. No Drawings.]

A.D. 1863, December 7.—No 3069.

PIERCY, FREDERICK. — (*Provisional protection only.*) — " Improvements in the application of heat to water and other fluids, " and in apparatus for the same." These are, " submerging the " heating medium and apparatus therein, whether it be gas, " paraffine oil, coal, or other fluid." In preference, gas is employed by enclosing " a suitable gas burner within a chamber, " which is completely enclosed from below, and from which air " has access and egress by means of a vertical channel, carried up " to a height according to the depth it is desired to plunge the " heating burner." " The downcast air tubes, two in number,

" are flat and large, as is also an up-cast one, in which the heated
 " air and products of combustion rise after circulating in the
 " heating apparatus below." The apparatus is connected " by
 " means of a flexible tube to a gas-supply pipe, so that the appa-
 " ratus may be readily handled and removed from the fluids in
 " which it is immersed." In applying this to a stove, the stove
 is filled with water, and the apparatus plunged into it. When
 large quantities of gas is used the up-cast tubes are conducted
 into a flue or channel. For large heating purposes coal may be
 used. " Oil, paraffine, or other similar inflammable material may
 " be burnt in a lamp disposed as described with reference to gas,
 " and similarly applied to heating purposes."

[Printed, *ad.* No Drawings.]

A.D. 1863, December 8.—N^o 3096.

HENRY, MICHAEL.—(*A communication from Charles Joseph Louis Meynard.*)—"Improvements in apparatus for regulating the pas-
 " sage of aeriform and other fluids." These are "the combination
 " of a valve, slide, tap, door, louvre, or other contrivance for
 " intercepting the passage of aeriform or other fluid with an in-
 " strument or apparatus acted on by the transmission and inter-
 " ruption of electric currents, or the production, cessation, and
 " reproduction of electric action," "resulting from the variation
 " of pressure, speed, temperature, or other variable effect, action
 " or condition of, dependant on, or connected with the passage of
 " the fluid." As an example to control the passage of steam
 " a mercury pressure gauge is fitted to the steam pipe, and con-
 " ducting wires are carried into the tube of the gauge to a point
 " above any desired or determined level of the mercury. The
 " wires communicate with an electro-magnet which works regula-
 " ting apparatus connected with a throttle valve. When the
 " pressure exceeds its proper point, and the mercury rises to the
 " wires, electric contact will be made, and the regulating apparatus
 " will act and move the throttle valve till the pressure becomes
 " reduced and the mercury falls and breaks contact." In another
 arrangement a sliding frame or plate carries an electro-magnet
 and a beam or lever on which are two drivers and an amature;
 these drivers named "No. 1 and No. 2 turn ratchet wheels in
 " opposite directions; such wheels are on an axis in gear with
 " the spindle of a throttle valve, and only one driver is in gear
 " at one time, so that according as to which is engaged the direc-

"tion of the motion of the axis and hence that of the valve will be varied." "A centrifugal governor may be adapted for the purpose of the invention by bringing one conducting wire into contact with the governor spindle, the other wire being led into the course of travel of the ring, so that when the ring rises contact will be made and the electric regulating apparatus will act on the throttle valve."

[Printed, 8d. Drawing.]

A.D. 1863, December 12.—N° 3136.

CLAYTON, THOMAS.—"Improvements in generators for making gas from volatile fluids." These are employing "a generator having any convenient number of divisions, according to the number of lights required," the divisions are packed with sponge or other porous material and are fed with liquid through a tube or slot in each division or spout, consisting of "petroleum, naptha, camphine," &c. These tubes are connected with a trough or cistern supplied with the fluid from a holder provided with a "supply valve connected to a lever leaving a tail or arm on the other side of its fulcrum, so placed, that when the plug at the top of the holder is screwed in its hole, it shall come in contact with the tail or arm of the lever, and open the valve and allow the fluid to pass to the trough; but when the plug is drawn to allow the holder to be refilled the valve drops upon its seating by its own weight and prevents the fluid from overflowing the trough and divisions in the generator." When the divisions are supplied with fluid there is forced into them "a current of air, hydrogen gas, carbonic oxide, or any other inflammable gases, and the combination thus formed with vapour or gas of the volatile fluid passes through one or more tubes to the burner or burners." To prevent the fluid from being too much chilled by the evaporation, there is placed between the trough and divisions layers of dry sawdust, hair, or other non-conductor." To prevent accidents from carelessness the generating box and parts connected with it are enclosed in a metal case and the spaces are filled "with sand, or water and sand combined, or other matters of a similar nature," and at the top of the metal case are placed over one or more sheets of wire gauze so that in filling the vessel any liquid spilt will pass through the wire gauze and be prevented taking on fire.

[Printed, 8d. Drawing.]

A.D. 1863, December 19.—No 3213.

TOOTH, WILLIAM HENRY.—"Improvements in the manufacture of iron and steel, and in the machinery, apparatus, and furnaces used therein, and for the production and application of gas to be employed in such manufacture, and the application of parts of the said apparatus to the manufacture of glass and alkali." These are, in reference to this subject, as follows:—It is stated that there can be produced among other gases named, carbonic acid, carbonic oxide, and carburetted hydrogen. "The furnace is composed of an upper and lower chamber, the two chambers being separated from each other by a perforated arch or arches of brickwork enclosed with an iron casing lined with brickwork to the sides of which are fitted two or more fire-places so arranged that they can be charged with fuel, so that the atmospheric air cannot pass through into the lower chamber without coming in contact with the incandescent fuel and thereby become decomposed. On the top of the furnace are fitted suitable pipes with valves or dampers for carrying away the gases to suitable pumps, reservoirs, or exhausters, to be used in metallurgic operations." "The upper chamber is charged with coals and the fire-places on the sides of the furnace are charged with fuel lighted, and a stream of air is caused to pass through the fuel. The gaseous products of combustion will enter the lower chamber, pass through the perforated bottom of the upper chamber, and distil off the gas from the coals therein; this gas may be used either for purifying the metal, or for illuminating purposes, or for combustion."

[Printed, 5s. 10d. Drawings.]

A.D. 1863, December 21.—No 3226.

HENRY, MICHAEL.—(*A communication from the Société Hermann Lachapelle et Glover.*)—(*Provisional protection only.*)—"Improvements in the mode of and apparatus for controlling the passage of fluids to and from casks and other vessels." These are a "tap or appliance" which may be arranged for the purpose, as follows:—A tube or socket perforated for the passage of fluid is fitted with a valve or plug pressed against its seat by a spring. This socket is let into the vessel, and from it leads an adjustable tube or fluid way, within which is a rod worked by a nut, key, or otherwise, and connected with or extending to or

towards the valve or plug. At the outer end of the fluid way is a nose end or outlet, preferably of an L-shape, one limb receiving the end of or arrangements for working the rod and the other serving as an exit. The rod when worked inward will force back the valve and open a thoroughfare for the fluid which may thus be discharged, raised, or forced out. The spring will force the valve forward and stop the fluid way stanchly. The outlet may be applied as an "inlet way by connecting it with a supply of liquid or gaseous fluid, so that the same may be forced into the vessel to fill it with liquid or charge it with gas, in which case the vessel should be fitted with two such appliances, one for filling or emptying it and the other for the escape of air or gas. The appliance may be readily removed and the orifice closed by a screw or other plug."

[Printed, 4d. No Drawings.]

A.D. 1863, December 29.—N^o 3289.

TAYLOR, NATHANIEL FORTESCUE.—"Improvements in means or apparatus employed in increasing the illuminating power of coal gas." These are, first, employing "a chamber into which the gas to be acted upon is allowed to flow at one end or part thereof, and from which it is allowed to flow to the burners at an opposite end or part thereof;" the space between the inlet and outlet of the gas is divided by a partition or partitions so as to effect extended surfaces for the passage of the gas, and in this extended surface applying sponge or other absorbant that will allow of the passage of the gas, and will take up hydrocarbon liquid. "One method of forming such chamber is by the vertical partitions being in series, affixed alternately to and extending from opposite sides of the chamber, leaving passages at the opposite ends of each partition alternate for the passage of the gas in a circuitous or zig-zag course." "Another method is by arranging the internal passage in a sort of helix which may be again divided by a vertical partition open only at one of its ends so as to cause a return of the gas back after it has traversed in one direction. The hydrocarbon liquid is supplied to this chamber from a reservoir through a passage with a tap or valve, and it may be kept at a uniform level by the aid of an air tube dipping just below the desired level of liquid in this chamber and rising to the upper part of the reservoir."

Second, supplying the reservoir of such apparatus, with hydro-carbon liquid, so as to avoid risk of explosion by ignition of the vapour escaping during such supply; for this purpose the supply vessel has one passage from its neck provided with a tap or valve for closing it, and another passage descending through the neck to within a short space of the bottom of the vessel, both passages open at their upper ends, by preference, into an open mouth or cup. The filling of this receiver may be through one of the passages, whilst the air or vapour contained therein, escapes by the other, the passage through which is opened by the tap or valve. In supplying the reservoir bringing "these two passages of the feeding can or vessel which is then inverted over and in close contact with a passage or passages corresponding with them, when, by opening the tap or valve in the one passage the liquid will pass by that passage into the reservoir, whilst the vapour or gas in the reservoir will pass into the feeding can or vessel by the other passage."

[Printed, 2s. Drawings.]

1864.

A.D. 1864, January 5.—N° 30.

HAYS, JOSEPH JUDGE.—"Improvements in the manufacture of peat charcoal, and in the apparatus employed therein." The apparatus used in the first stage consists of a grinding mill formed of metal discs "fixed vertically in a frame," and having the contact surfaces "grooved either radially or spirally; one of these discs is mounted on a horizontal spindle" driven by a pulley; "the other disc is fixed to a sliding frame," which may be adjusted by means of screws.

The ground peat in its moist state is cut into squares and conducted on an endless band through a drying kiln.

The retort for carbonizing the peat "is of a rectangular form," and is placed vertically in an oven." It is constructed with a central pipe "through which the heat from the furnace is caused to pass on its way to the chimney." "The retort is furnished with a door at the top for supplying it with peat, and

“ with a similar door at the bottom for letting out the charcoal ;
“ this bottom door is formed with a projecting flange of sufficient size to close the opening in the external wall when the
“ carbonizing process is in operation.” A pipe is fixed near the bottom of the retort, which conducts the “gaseous products
“ derived from the distillation of the peat into a receiver,” in
“ which the heavier oils and tar become deposited, from thence
“ the gases pass along a pipe” “ through which a current of cold
“ water is made to flow in an opposite direction to that by which
“ the gas travels, emptying into the first receiver, or an additional
“ vessel wherein the oils and water together are kept at a given
“ level by means of a closet trap, which allows the excess to pass
“ off into other receivers, where the watery portions will separate
“ on cooling and the tars and oils may be extracted for future
“ treatment.” The gases are to be collected “for illuminating or
“ heating purposes.”

[Printed, 1s. Drawings.]

A.D. 1864, January 5.—N° 33.

KIDD, JOSHUA.—“Improvements in applying and regulating
“ any required liquid used in the process of generating gas or
“ steam, or for the carburetting of gas, for supplying and regulating the water to gas meters, and oil for lubricating, and in
“ apparatus connected therewith.” These are, first, the adaptation and application of a constant level feeding or bird-cage fountain for supplying oil to a retort for generating gas together with a condenser which is a circular worm or coil ; and a regulator acting as follows :—When the gas is generated quicker then it can escape at the ordinary outlet, it passes from the condenser up a pipe into a compartment above the condenser, which is nearly filled with water, and the gas is again forced up another pipe into an upper compartment, and exerting a great pressure in the retort it drives the liquid so far away from the retort that gas ceases to generate in it.

Second, the application of the “constant level feeding or bird-cage fountain for carburetting gas for single street lights, and
“ for supplying oil for lubricating the journals of railway
“ carriages, and for supplying oil to a receptacle” when “steam
“ is intended to be passed over an hydrocarbon oil for generating
“ vapour for burning purposes.” For street lamps the liquid

receptacle is placed above the lantern and the regulating chamber at the bottom, a well or recess is formed under the gas burner for the reception of oil from the regulating chamber to which it is connected by a pipe, and the liquid by capillary attraction is carried up from the well to the burner. The gas is made to pass into the well and combines with the vapour from the volatile oil. "For lubricating the journals of railway carriages the receptacle for oil is placed in the ordinary grease box over the journal. and the box itself forms the regulating chamber. A hole is made in the bottom of this receptacle, and when unsealed by the oil in the grease box bubbles of air will rise in the receptacle and allow the oil to flow into the box. The outlets for the grease are stopped up, and the oil is carried down to the journal by capillary conductors which are brought in contact with the oil as it rises and falls by the jolting motion of the carriage." In the Provisional Specification it states that "for feeding wet gas meters it is simply necessary to attach a pipe from the regulating chamber to conduct water to the meter below the water line."

A second plan to maintain a constant level of liquid in the regulating chamber, is by placing in it a float to the centre of which is attached a conical spindle valve. "The receptacle or holder in this case does not require to be air-tight, and the regulating chamber in both plans must not be air-tight at the top."

[Printed, 10d. Drawing.]

A.D. 1864, January 15.—No 109.

BAKER, JOHN EDWARD. — "Improvements in retorts and furnaces for distilling coal," peat, &c. and for the manufacture of illuminating gas. The retort has the general shape of a cylindrical boiler with a central flue. In front of the flue is the furnace, the flame "from which passes from the central flue along the lower sides of the retort" to the furnace end, and from thence along the upper sides to the chimney. It is filled from an opening at the upper part of the front end, and emptied from an opening below. Pipes at the back end convey away the products of distillation. As with some flued boilers, the furnace may also be built to act on the outside, the flame being afterwards conducted through the central flue."

[Printed, 8d. Drawing.]

A.D. 1864, January 16.—N° 121.

ROGERS, WILLIAM CHARLES.—“Improvements in gas lamps.” These are in a hall or other lamp, making “the suspending frame by which the perdifume is carried as well as the other fixed parts of the lamp in the ordinary way. But instead of hanging the ring by which the globe or glass is carried directly to the chains,” the “ring is connected to two or more semi-tubular pieces of metal which slide upon two or more tubes of the framing of the lamp.” The tops of the semi-tubular pieces are connected to chains of about one-half the usual length which pass over pulleys, and have counter-balance weights of the ordinary kind. When the globe of glass is in its ordinary or raised position the supports of the globe or glass between the ring of the said globe or glass and the pulleys consist of the semi-tubular pieces described, the chains proceeding immediately from the tops of the said pieces over the pulleys to the counter-balance weights. When the globe or glass is drawn down, as in lighting the lamp, the semi-tubular pieces slide upon the tubes of the framing, drawing the chains over the pulleys and raising the weights; and it is only when the globe or glass is lowered that any chain is visible on the inner sides of the pulleys.” Although two semi-tubular pieces are enough to support the globe or glass, yet more than two of these pieces may be employed to carry the globe or glass. “Instead of the semi-tubular pieces described, complete tubes may be used, and instead of making the globe or glass descend, arms carrying the globes or glasses may be connected to and move with the sliding part of the lamp.”

[Printed, 10d. Drawings.]

A.D. 1864, January 19.—N° 146.

JOHNSON, JOHN HENRY.—(*A communication from Warren Fish.*)—(*Provisional protection only.*)—“An improved attachment for lamps or gas burners.” This consists in “supporting vessels and other articles over the lamp flame to be heated for cooking and other purposes,” and consists in combining “a support for sustaining vessels or other articles to be heated with a standard rod and adjustable clamp, which will admit of the apparatus being attached to any convenient part of a lamp or gas burner, and when so attached shall hold the vessel or

" article in a position immediately over the flame. The standard rod is in some cases made telescopic, or otherwise adjustable in length or height."

[Printed, 4d. No Drawings.]

A.D. 1864, January 21.—N° 156.

WILSON, JAMES. — "Improvements in hydraulic valves for working gas purifiers." These are, "the arrangement and construction of the divisions of the upper or holder portion of hydraulic valves for working four or a smaller number of gas purifiers." The upper or holder portion of the valve is divided into six divisions which reach three fourths of the way down, and the gas passes from the main inlet pipe into the first purifier, after traversing which it passes out by a pipe through a division of a valve by means of a pipe into the second purifier, after traversing which it again passes by means of a pipe through another division of the valve, when it again passes by means of a pipe into the third purifier, and so on; by altering the position of the upper or holder portion of the valve, the gas may be made to traverse either through three or through one of the purifiers as it may be required.

[Printed, 2s. Drawings.]

A.D. 1864, February 2.—N° 280.

HAWKINS, JOHN, and HAWKINS, CHARLES. — "Improvements in the manufacture of gas for illumination and other purposes, and in apparatus connected with the same." These are, in reference to this subject, in place of manufacturing gas for illuminating purposes in a confined chamber or retort heated from the exterior, a stack of coals are built surrounded with a wall, in the centre of the coals is a stack of open brickwork and above this is a short flue of close brickwork; on the top of the stack are iron covers which unite to the lower part of the flue; from the brick flue is an iron pipe having a valve way at the top, from which is conducted along another pipe which is fitted with a throttle valve. This pipe is connected with a vessel, underneath which is a furnace which heats it, and a pipe leading from its lower part "the use of which is for carrying off the ammoniacal liquid and tar that separates itself from the gas in its passage through the flue, and will deposit itself in this vessel," while

the gas is drawn off from the top of this vessel by means of a fan; from the fan the gases pass off by a pipe to the condenser through which any number of pipes are fixed, some three or four inches under water, the gas escapes from the top of the condenser down a tube and then along another tube to the lower side of which is attached an inverted syphon pipe through which the ammoniacal liquid and tar escapes, the gas continuing along and up an upright pipe into a gas-holder, from which it escapes down through a tube "to the purifier, condenser, and gas holder in the ordinary way for purifying and storing away gas for illumination." There is an air regulator in the wall surrounding the stack of coals with which is combined the means of supplying steam to the cokes for desulphurizing, &c. therein, also for extinguishing the fire, &c.

[Printed, 10d. Drawing.]

A.D. 1864, February 2.—N^o 281.

HAMMOND, GEORGE, and KEMP, JAMES WILLIAM.—"Improvements in the manufacture of illuminating gas, and in apparatus to be employed therein." These are, first, "the system or mode of manufacturing permanent illuminating gas from volatile hydrocarbons by apparatus arranged and acting" substantially as follows:—

Second, "the use of a vaporising chamber acted upon by a low temperature separate from the retort or worm." This is a box which is so arranged as to be heated "not less than 120° F.," its bottom is some inches below the entrance of the worm or generator, or arranged that the liquid is all vaporized on entering the generator; there is a plug near the bottom for removing any impurities, and a funnel at the top so that a small quantity of water may enter a pipe leading into the generator. A cistern placed above contains the hydrocarbon "of a sp. gr. of 630 and upwards (water being 1000)," and the flow is regulated by a tap.

Third, "making retorts, worms, or generators for making permanent illuminating gas from hydrocarbons, of copper," and protecting them with fire-clay. The spaces are filled with fire-clay, and the casing of iron made in halves is held together by a hoop at each end. "The exterior of the casing is kept when making gas, at a red heat."

Fourth, "bringing of the interior of the cistern for volatile hydrocarbon liquid, when closed from the atmosphere, in communication with the gas generated." After the gas passes through a condenser it passes by a pipe to the gas holder, and from this pipe is attached another pipe, upon which there is a tap in connection with the top of the cistern containing the hydrocarbon.

[Printed, 8d. Drawing.]

A.D. 1864, February 3.—N° 284.

BROWN, JOHN WEIR DRAPER, and WILLIAMS, JOSEPH.—(*Provisional protection only.*)—"Improvements in gas burners, especially applicable to railway lamps and lanterns." These refer to concentric ring burners for gas, and consist "in providing independent feed pipes to each separate ring, and in the employment of a tap or regulator in each of such feed pipes, in order that the height of flame in every ring may be adjusted." "For lamps for railway stations and other similar lamps" the burner is provided "with a chimney, which passes through the top of an enamelled or other convex reflector, and opens into an outlet pipe passing through the cover of the lamp." It is preferred "to form the case of the lamp octagonal and tapering towards the base.

[Printed, 4d. No Drawings.]

A.D. 1864, February 4.—300.

BARK, SAMUEL, and ATTWOOD, THOMAS.—(*Provisional protection only.*)—"An improved slide for gasaliers." This consists "in substituting mercury in place of water or other liquid within the central tube or slide of gasaliers and in connection with which," "placing a top on the inner slide," that "in case of a chain or chains breaking the body of the lamp can only fall a certain distance, and therefore still preserve a perfect joint and protection from the escape of gas." "The stop before referred to may be so contrived with a regulating screw to retain packing, as to provide a means of tightening up the joint at that part to prevent the mercury from escaping below."

[Printed, 4d. No Drawings.]

A.D. 1864, February 15.—N° 336.

STEINMETZ, ANDREW.—“Improving and intensifying the light of horizontal gas burners, and furnishing the same with globes.” This consists as follows:—“When the flame is delivered horizontally instead of being vertical or upright as usual,” the globe is made “entire at the bottom, the opening and flange for fixing it being at the side, at right angles with the usual opening at the top, thereby producing a shadowless light.” The burner is “the common jet, fish tail, or bats wing,” fixed horizontally and the stem or support is furnished “with an independent gallery, attached screwwise or sliding with a binding screw, to adjust the gallery to the proper distance from the mouth of the burner.” “Instead of the usual screw to fasten the globe, which often causes breakage,” a curved flange and screw is used, “the flange being moveable on a pivot, so as always to remain horizontal whilst the screw turns.” “The stem or support of the gallery and burner is elongated so as to bring the flame below the centre of the globe.” “A wire gauze is fixed to the stem or support of the burner, filling the side opening of the globe to regulate the current of air passing to the flame.”

[Printed, 4d. No Drawings.]

A.D. 1864, February 19.—N° 432.

ARNOLD, FREDERIC JOHN.—(*A communication from Thomas Arnold.*)—“Improvements in apparatus for producing and burning combustible gases for heating and lighting purposes.” These are first “constructing apparatus for producing combustible gases for heating or lighting purposes, consisting of an upper and lower chamber in close contiguity heated in any suitable manner, in the lower one of which chambers steam is decomposed by being made to pass through highly heated substances” “such as anthracite coal, melted lead, iron turnings, &c.,” with which “the oxygen of the steam combines, whilst the liberated hydrogen is made to pass into the upper chamber, there to combine with carbonaceous gases resulting from the volatilization of oil or liquid hydrocarbons introduced into such upper chamber, and whence the resulting combustible gases are conducted through one or more pipes,

" either to burners situated below and serving to heat the apparatus, or to wherever required."

Second, "the arrangement of apparatus for producing and burning combustible gases." Instead of burning "the whole of the gas produced under the apparatus as shown," only a sufficient quantity may be then burnt, and the remainder may be conducted "through a separate pipe from the upper chamber." to wherever required for heating and lighting purposes, "or the apparatus may be placed inside a fire-brick furnace and heated by means of the fire-grate of the latter."

[Printed, *8d.* Drawing.]

A.D. 1864, February 23.—N^o 452.

SANDERS, JOHN, junior.—"A new or improved gas regulator for controlling or regulating the flow or pressure of gas required to be used for illuminating purposes." This consists in providing, by preference, a circular chamber, small or large, contracted at the bottom and terminating with a valve chamber which is fitted with a hollow or other conical valve, and which valve is connected by a wire or reduced neck to a thin metal disc which rests on the bottom of the upper chamber before referred to," this exterior part of the chamber is so "arranged for screwing to or otherwise readily connecting with gas fittings, either near the meter or main supply pipe, or any intermediate position," according to its general size and requirement, but its compact and symmetrical form renders it exceedingly applicable to be united to the extremity of chandalier arms or brackets, by the regulator being screwed at its lower end for that purpose, while the burner, which may be of any shape or construction, argand or jet may be applied at the top."

[Printed, *6d.* Drawing.]

A.D. 1864, February 24.—N^o 462.

DURRIEU, LOUIS ADOLPHUS.—(*A communication from François Maurel.*)—"Improvements in shades for gas lights, lamps, and candles, and supports for holding the same." These are, "forming a framework of metal or other non-combustible" material, into which framework is arranged sheets or pieces of mica or talc, "either in the natural state, as when split into thin sheets or pieces," or the surface of the same is ground "to give

" it a dull appearance like ground glass," or it is coloured or ornamented " in any way that may be practicable without interfering with its non-combustible properties." " The framework which holds this mica or talc has elongated points which radiate from the glass or chimney of the light to which the shade is applied, to which points or ends is fixed the paper, cardboard, cloth, silk, or other material of which the shade is constructed." The shade requires in most cases a support, which is made with iron, bent into one or more shapes or forms. " The intention of the mica or talc is to prevent the heat of the flame or glass of the light upon which the shade is used, from burning the substance or substances of which the other portions of the shade are made, and also to allow light to pass through the upper part of the shade."

[Printed, 107. Drawing.]

A.D. 1864, February 24.—No 467.

ESPLIN, CHARLES.—" Improvements in apparatus for regulating the flow of gas to burners." These are said to be " applicable to that class of gas regulators in which are employed inverted vessels, the lower edges of which dip into quicksilver," and " consist in so arranging and constructing such descriptions of regulators that one side or surface of each inverted vessel shall be at all times open to and subject to pressure of the outer atmosphere." At the upper end of the gas supply pipe, near the burner is a vessel containing quicksilver, the supply pipe rises within this vessel some distance above the top of the quicksilver; above this pipe " a stationary or fixed conical valve is situated, the base of which is downwards. An inverted vessel is placed in the vessel containing the quicksilver, so that its lower edges dip into the quicksilver. The inverted vessel has in its centre a bevilled or conical hole corresponding with the conical valve." The vessel is composed of two concentric cylinders, the inner or smaller one is of somewhat larger diameter than the upper part of the supply pipe; the outer or larger cylinder of the inverted vessel contains atmospheric air and has a tube open to the outer air. " The burner is fixed at the upper part of the cover of the vessel containing the quicksilver." When a regulator is required for a large number of lights, the inverted vessel moves on an axis at one side where there is an

" arm which is weighted and capable of adjustment." Different forms of regulators embracing the above principle are described.

[Printed, 8d. Drawing.]

A.D. 1864, March 2.—N° 521.

RAEBURN, JOHN PETER.—(*Provisional protection only.*)—

" Improvements in the production of oil, or oleaginous or spirituous and gaseous matters from coal and other mineral substances and vegetable deposits, and in the machinery apparatus, or means employed therein." These are "employing retorts having a circular, reciprocating, or other convenient motion imparted to them from any convenient source of prime mover, and of any convenient shape or form, but by preference made cylindrical." In their sides or ends are doors or covers secured by "screws or in any other way, as usual," for introducing the materials. In one or both ends are pipes which branch off in any convenient direction to condensers. A joint or joints being made "in the end or ends of the retort to enable it to move as herein-before described, whilst the pipes remain stationary. The retort is enclosed in a brick furnace, as usual, and heat applied to it in the ordinary manner."

[Printed, 4d. No Drawings.]

A.D. 1864, March 11.—N° 615.

BOWDITCH, WILLIAM RENWICK.—"Improvements in regulating the flow of gas in railway and other carriages, and in apparatus employed to regulate the flow of gas in such railway and other carriages, part of such improvements being applicable to the regulation of gas supplied to stationary lights." These are, first, "counterbalancing of gas holders in carriages to secure uniformity of pressure, and therefore uniform flow of gas." This is effected by ascertaining the weight to counterbalance the gas holder, and counterbalancing it, "by preference, by a chain which weighs per foot as much as the gas holder loses in weight by falling through that space." A chain is described passing over a pulley and having a weight attached. Instead of the weight is a cord carried round a pulley affixed to the floor of the carriage, the end being fixed to the top of the gas holder. Or the counterbalance is a bent lever, having a weight attached to it, and the top of the gas holder attached to the other end of it.

Second, the regulation of the flow of gas by a tap or valve moved by the gas holder. The handle of the tap is connected with the gas holder so as to be opened and shut by the rising and falling of the gas holder.

Third, regulating the flow of gas by means of diaphragms of paper, cloth, or similar porous substances placed between two rigid surfaces screwed together.

[Printed, 8d. Drawing.]

A.D. 1864, March 15.—N^o 653.

BALLER, EDMUND.—“Improvements in gasaliers commonly “ called water-slide gasaliers.” These are, making the outer or sliding tube of the said gasaliers, at or near its upper part, of glass or other transparent or nearly transparent material, or making the upper part of the said tube open into a vessel of glass or other transparent or nearly transparent material; or inserting pieces of glass or other transparent or nearly transparent material, in or near the upper part of the said tube, for the purpose of permitting the level of the water or the liquid in the said tube to be readily ascertained and any deficiency supplied.

[Printed, 8d. Drawing.]

A.D. 1864, March 16.—N^o 675.

WAKEFIELD, EDWARD THOMAS.—“Improvements in gas “ lighting and ventilating apparatus.” These are said to be in “ a novel combination of parts,” as follows;—Taking an argand burner and glass chimney, and placing over them a porcelain, glass, or earthenware pipe; to the bottom of this pipe is fitted a transparent glass shade, and the top or upper part of the pipe is connected with a horizontal pipe of similar material to the first-named pipe, and external to the ceiling, and opening into a chimney or flue. A valve is placed in this latter pipe, but in some cases this valve may be placed with.

[Printed, 10d. Drawings.]

A.D. 1864, March 23.—N^o 739.

TYERMAN, FREDERICK.—“Improvements in apparatus to be “ used in combination with parts of gas and lamp fittings.” These are, “for increasing the illuminating power of artificial “ light,” “by directing the draught from the centre towards the

"sides of the chimney, glass, or fitting." The apparatus consists of "a ring of plain or perforated metal, talc, or other combustible material having its edge or edges flat, turned, or soothed, and having fixed, if found necessary, on the under side a piece or pieces of asbestos or other material of a like nature." To this ring is attached "a piece or pieces of plain or perforated metal, talc, or other incombustible material of a flat, conical, round, elliptical, or inverted semispherical form, having, by preference, horns or projections on the edges or other parts of the same, such piece being of smaller diameter than the interior of the chimney of the lamp or gas burner. The ring of the apparatus is to be applied to the top of the ordinary chimnies, glasses, or fittings of gas or other artificial lights, whilst the other portion is suspended within the chimney or glass, or fitting and being of smaller diameter. A clear space or opening is left between the outer edges or surface of the suspended portion and the inner surface of the chimney or glass or fitting with which it may be used. If preferred, the ring may be dispensed with, and the internal suspended portion of the apparatus may be hung from the edge of the chimney or kept in its place by hooks, spring clips, or otherwise."

[Printed, 8d. Drawing.]

A.D. 1864, March 24.—N^o 746.

BARK, SAMUEL, ATTWOOD, THOMAS, and ROBINSON, JAMES DAVID.—"Certain improvements in slides for gasaliers, as also in the means of regulating or stopping the flow of gas, parts of which improvements are also applicable to chandeliers where oil, camphine, or other inflammable liquids are used for illumination." These are, first, "the application to pendant chandeliers (whether required for the burning of gas or other luminous material, the said chandelier being required to be raised and lowered by counterposing weights) of external rods for regulating its range of action, and preventing the separating or falling of such chandeliers from the breaking of (or ?) parting of the chains or other means of connecting such chandeliers with the counterpoising weights."

Second, using "a self-acting valve actuated by a float," so that when "the evaporation of the water in such-like slides has reduced the liquid below the regulating point, the valve of

" itself, in consequence of the descent of the float, will close up
 " the gasway, and prevent any escaping until a fresh supply of
 " water or other suitable liquid is applied."

Third, applying to chandeliers, "a valve placed (as in the last
 " case) over the gasway, in the ball or ceiling joint," and which
 valve is connected with an ornamental knob or otherwise, placed
 concentrically on the lower extremity of the chandelier body,
 below the main tube working through a stuffing box, and by the
 turning of this knob the valve above is actuated so as to cut off
 or admit the gas to the body of the chandelier, to flow through
 the radial arms with an equalized pressure to the burners, so that
 the gas will be simultaneously admitted to the burners or cut off.
 "The valve is held down" on its seat by any suitable elastic
 pressure placed above, such as a helical spring or its equivalent.
 In the Provisional Specification there is also the use of mercury
 in place of water, and of a stop for regulating, &c. the lowering,
 &c. of chandeliers set forth as part of the improvements, but in
 the Final Specification they are said not to be "altogether new,"
 and are not claimed.

[Printed, 10d. Drawing.]

A.D. 1864, March 24.--N^o 747.

STROUD, JOHN THOMAS.--" Certain improvements in lamps
 " for various purposes, and in the fittings and parts in connection
 " with the same." These are, first, lamps required for halls, &c.,
 where the flame, whether from gas or otherwise, is protected by
 a globe or shade, "so supporting the globe or shade that it may
 " be entirely lowered for the purpose of exposing the burner
 " either for dressing, lighting, or extinguishing such lamps."

Second, in "raising and lowering suspended lamps for burning
 " oils or spirits such as are used generally in India," "dispensing
 " with the usual diverging rods that connect the lamp proper
 " with the canopy or top ring, and substituting chains which
 " serve not only for connecting the lamp with the upper part,
 " but also for connecting it to the annular counterpoising
 " weight;" also providing "a kind of bayonet or lock joint or
 " equivalent means, so as to fix the weight close against the
 " pulley frame;" and sometimes providing means for raising or
 lowering the cotton of such lamps.

Third, when embellishing with glass covering the metal por-
 tions "with that material, or glass tubes may be bent or moulded

"into a curved or scroll form, and in like manner pendant or radial arms or parts of chandeliers and gasaliers may be formed of any suitable design."

Fourth, in lamps exposed to draughts from motion, or otherwise, using a windguard; also using a wickholder. This consists "in supporting the tube between two hollow discs perforated in opposite directions, which prevent the oil below from violent motion being flirled through the airway to the outer part, and at the same time it has a tendency, from its always ensuring a free airway, of keeping the cotton holder cold, adapting the mode for holding or securing such lamps to the person, whether riding, driving, or walking, as may be required."

[Printed, 10d. Drawing.]

A.D. 1864, March 24.—N^o 751.

BARNES, ISAAC. — (*Provisional protection only.*)—"Improve-ments in or additions to gasaliers and gas brackets," These are, first, in constructing gaseliers, fixing near the bottom of the pipe conducting the gas a glass globe or vessel with a reflecting surface, silvered or otherwise. The lower part of the globe tapers nearly to the size of the pipe on which it is supported. At the bottom of this reflecting globe are a series of horizontal pipes, which are connected to the central vertical pipe of the gasalier. Each of these radial pipes is supplied with a burner projecting a horizontal flame. Surrounding the bottom and sides of each of the said horizontal flames is a shade or glass, made in the form of an elongated shell or shallow dish, the wider part of which is "most distant from the axis of the gasalier, and the convex sides of the shells being downwards." The flame is situated within the concavity of the shells or shades. The shades "are not situated horizontally, but are somewhat inclined to the central pipe of the gasalier, to which central pipe the narrow ends of the shades converge." The narrow ends of the shades are furnished with metallic holders, by which "they can be readily connected or disconnected from the radial pipes or burners with which they are respectively used." The gasalier below the shades is supplied with an ornamental termination. "The central reflecting globe opposite each of the burners is made into a series of faces, so as to produce a reflection of the flame of the burner in each of the facets opposite the flame." Gasaliers may be made with hydraulic slides.

Second, in constructing brackets, providing them with burners projecting horizontal flames, and applying to them shades of the kind before described with reference to a gasalier. Also fixing to the bracket a reflecting surface, "consisting either of a hemisphere " or other portion of a sphere," "behind the burner and glass " shade."

[Printed, 4d. No Drawings.]

A.D. 1864, March 26.—N° 755.

DUBOURG, VICTOR.—"Improvements in gas burners." These are as follows:—"The gas burner is, as it were, arranged so as " to form a kind of hearth, with a grate and chimney." The grate, in the lower inside part thereof, "is a system of wirework, " and has a perforated bottom and one or more gratings made of " woven wirework. The chimney or enclosure of the flame in " immediate connection of the burner is formed with an opening " of suitable size, from which the flame passes." The upper part of the gas burner "consists of a kind of chimney or hood " having a larger opening than that part of the burner through " which the gas first issues." The opening or outlet of the chimney or hood "may be modified in size and form, according to the character of the burner to which it is applied. The several parts of the apparatus are made of or coated with platinum, and a considerable saving of gas is thereby obtained.

[Printed, 8d. Drawing.]

A.D. 1864, March 31.—N° 806.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Eugene Frederic Alexandre Goguel.*)—(*Provisional protection only.*)—"Improvements in gas-generating apparatus." These improvements, it is said, are made with a view to ensure "regularity in " quantity and quality of the gases produced, the most prominent " of which are the arrangements which permit of the continuous " emptying of the apparatus at its base during the production " of the gases and of the combustible substances fed into the " top thereof, descending uniformly without necessitating any " stoppage for the removal of cinders, clinkers, or scoriae. This " removal at the base causes the desired regularity in the descent " of the combustible substances during distillation and the pro- " duction of the gases." The combustible material is first placed

in a metal box on the top of the gas generator; this box slides horizontally on a plate (and is fitted with a tight-fitting cover), so that it can be discharged into the gas generator below and be moved back so as to be refilled with combustible material. The gas issues from apertures near the bottom of the gas generator; the gas generator is supported on a chamber, at the bottom of which are one or more apertures "through which the clinkers, cinders, ashes, and other matters are removed." This apparatus may be used as a smoke consumer.

[Printed, 8d. Drawings.]

A.D. 1864, April 5.—N^o 841.

MARTIN, STEPHEN, the younger, and YOUNG, EDWARD.—(*Provisional protection only.*)—"Improvements in the manufacture and application of fire-resisting cements and materials." These are, "taking the ore of titanium or titanic acid, commonly called rutile, or any other ore of titanium (such, for instance, as that called ilmanite), which may be pure enough for the purpose, and, after having pulverised it," mixing it "in about even proportions with ground ganister (a silicious stone) or silica as pure as can be readily obtained," and moistening "the compound, when thoroughly mixed, with milk of lime. The mixture is then tempered and moulded into the required shape, and is dried and burnt similar to an ordinary ganister or silica fire-brick." Instead of using ganister or silica, as above, other materials may be employed and the above proportions may be varied. In some cases the titanium or titanic ore may be mixed with "carbon, steatite, or alumina, or silicate of alumina," and, instead of moistening with milk of lime, using water only or "water with sulphate of potash, fluor spar, or any other suitable flux or cement." Among a number of purposes named to which this material, when manufactured as above described, is to be applied, is in "the making of gas and other retorts."

[Printed, 4d. No Drawings.]

A.D. 1864, April 12.—N^o 923.

NEWTON, WILLIAM EDWARD.—(*A communication from Henry Watelet, Charles Watelet, and Edmund de Lacotte.*)—(*Provisional protection only.*)—"Improvements in the construction of the joints or connections and stopcocks for water, gas, and other pipes."

These are, in connecting metal and other pipes, first, by placing rings, washers, plates, &c. of india-rubber or other yielding material between the flanges or ends of two tubes, and "causing the pipes to be drawn together by means of screw bolts, cotters, wedges, or other equivalent means."

Second, "instead of placing the india-rubber rings or washers between the ends of two adjoining tubes, a short cylinder of rubber may be made to envelope the joint," and over it a metal or other collar. In some cases the joint may be first covered with a thin ring of metal. The whole is tightened by screws or wedges, or "by casting on the pipes shoulders with inclined faces, and notches made therein to allow the clamps to pass; the pipes may be held together securely without the use of screws, wedges, or cotters, by simply driving the clamps forward along the inclined faces of the shoulders." In some cases the ends of the pipes are cut in the shape of a **V** or other suitably shaped grooves to receive a ring of soft metal, and the two ends of the pipes are tightened up. Another joint may be produced by "cutting an external screw, or forming corrugations on the extreme end of one of the pipes and an internal screw on the socket of the other," and forcing between the two pipes a ring of soft metal. Or an external screw may be cut on the ends of both and a ring of soft metal forced into the corrugations by an enveloping collar.

Third, making the stopcocks wedge-shaped with inclined sides, and raising and lowering the same by means of a screwed spindle or shaft attached to their upper edges.

[Printed, *4d.* No Drawings.]

A.D. 1864, April 20.—N° 990.

FRASER, ALEXANDER COLVIN.—"Improvements in apparatus used in the manufacture of gas." These are, in constructing the iron retorts used in gas making, which may be of different forms, "but that known as the **D** form is preferred, "by casting three or more longitudinal ribs "upon the top and sides of the interior thereof, those from its sides being carried around the back of the same so as to form one continuous line." "Upon the bottom of the interior three or more ribs are also cast, the middle one of which is extended to the back, and continued vertically up its centre till it joins the one at the top." There may be also a number of ribs cast upon the sides, top, bottom

" and back of the retort, perpendicular to those before-mentioned. " On the outside of the retort and opposite to each of the lines " of ribs, the metal is slightly thickened," but this is not essential and is not claimed." " The whole of the ribs are chamferred " off towards the mouth so as to offer but little or no impediment " to charging with the scoop or otherwise." By this means the retort is strengthened.

[Printed, 8d. Drawing.]

A.D. 1864, April 29.—N° 1087.

HILLS, FRANK CLARKE.—"Improvements in and applicable " to furnaces to be used in the manufacture of gas."

The combustion of the coke is effected by air heated by the waste heat of the furnaces. It is "brought into the ash-pits, which are " closed in front to exclude the external cold air." In order to keep the fire-bars from getting too hot, and thus clinkering over, pans of water "are placed in the bottoms of the ash-pits," and kept filled with water heated by the waste heat. Heated air may also be admitted above the ash-pits, and for this purpose it is taken from the ash-pits through holes in the dead plates. Or V-shaped fire-places may be used, in which "the sides of the furnace support " the burning coke," and the dead plates are also proportioned to allow the passage upwards of heated air. In case "waterpans" be used, lighted coke should be kept over the air holes. The atmospheric air "may be heated in any convenient way;" but the plan preferred is that described by the inventor in a former Specification No. 13,912, Old Law. The air flows through iron pipes placed within other pipes, "through which the waste heat from " the furnaces passes away." In works in operation, these pipes "are placed horizontally in the tops of the beds of retorts," other pipes which descend to the ash-pits being connected to them. "The atmospheric air to be heated is drawn in at the " bottom ends of these latter pipes," and passes through the heated pipes into the closed ash-pits. Steam from "the tight " water pans" passes into the bottom end of these pipes with the air. "A pan for heating the water to be used in the water " pans may be placed on or in these flues."

With a new bed of retorts, the air heating pipes are placed "below the level of the ash-pits in specially prepared waste heat " flues."

[Printed, 1s. 6d. Drawings.]

A.D. 1864, April 29.—N° 1088.

HILLS, FRANK CLARKE.—“Improvements in the purification of gas, and in obtaining a valuable product in the process, and for the preparation of some of the materials to be used in the said purification.” These are said to be, first, “the use of persulphate of iron, or protosulphate of iron, or a mixture of both of these salts, combined with precipitated sulphate of lime or sulphate of magnesia, for the purpose of purifying gas.” In carrying out the above, the whole of these materials are “absorbed into or mixed with sufficient sawdust, spent tan, breeze, or such like porous matter, to make an open material easily permeable by the gas and placed on the trays of dry lime purifiers.” When the material will no longer purify the gas it is taken out of the purifier; it then contains a large quantity of sulphate of ammonia, “but to make it still richer in this salt,” it is spread out and exposed to the air to oxidize the iron of the sulphuret and sulphuric acid added to it, so as to “reform in the material, either partially or wholly, the same salts that were in it at first.” It is then used again for purifying the gas, and when saturated it may be treated as above and renovated “until the material becomes sufficiently charged with sulphate of ammonia.”

Porous bodies described in No. 12,290, Old Law, used for absorbing ammonia and any material composed of sulphate of ammonia and porous materials, are treated as above, until they become “charged with sulphate of ammonia as much as desired.” Sulphate of ammonia crystallized may be repeatedly made into a damp material with sulphuric acid, and other absorbant substances, may be treated in the same way with acid, and used over and over again, as above, but it is preferred to use the salt of iron material as first described.

Second, the manufacture of the said salts of iron from the “spent oxide of iron that has been used to purify gas after the sulphur has been burnt off from the said oxide of iron.” If the oxide of iron “has acquired much impurity, such as sandy or earthy matters, they should be separated from it;” by stirring it in a stream of water, it will be floated off by the water, “and the impurities will remain at the bottom of the vessel.” When the oxide is tolerably pure, sulphuric acid in a pan or in a reverberatory furnace is used to form with it the sulphates of iron. The acid acts quickest if the oxide is reduced to the metallic state

or the state of protoxide by heating it with powdered coals or other carbonaceous matter in a closed furnace or retort. An excess of acid is used which is afterwards "neutralized by lime or chalk so as to make about 20 per cent. of sulphate of lime in the mixture." The "impurities may be separated by means of a sand filter from the solution of the salts of iron formed."

[Printed, 4d. No Drawings.]

A.D. 1864, April 30.—N^o 1094.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Alexandre Perié.*)—"An improved chimney or glass for gas burners." This consists in having the chimney "bi-cylindrical, or composed of two cylinders, one of larger diameter for the body of the glass or tube, and the other of a smaller diameter for the chimney proper or top of the glass." The body of the glass or tube is cylindrical and suddenly narrows at top to join the chimney proper or top of the glass, "which is likewise cylindrical, and is of smaller diameter than the body."

[Printed, 8d. Drawings.]

A.D. 1864, May 7.—N^o 1156.

JOHNSON, JOHN HENRY.—(*A communication from Ernest Jourdan.*)—"Improvements in apparatus for economizing the consumption of gas." These are, "the application and use in combination with a gas burner of a piece of metallic wire gauze or reticulated fabric composed of any other suitable material placed immediately over and in close contact with or proximity to the orifice of the burner," substantially as follows:—"The gauze may be fitted inside a metal or other cap provided with a slit or other suitable opening at the top to allow the gas to pass through, after passing through the gauze, such cap being placed over and fitting accurately around the burner, and provided with one or more projections or catches for the purpose of holding the same securely in its place."

[Printed, 6d. Drawing.]

A.D. 1864, May 7.—N^o 1162.

ABBOTT, JOSEPH RICHARD.—"Improvements in gasaliers, chandeliers, and other pendent sliding lamps." These are, first, preventing "the escape of gas from gasaliers in case of loss of

"balance by the breakage of a balanced chain," by "forming a
"conical plug upon the lower end of the ordinary slide tube, and
"a corresponding conical socket upon the cap of the water cup,
"into which socket the conical plug becomes wedged should
"the gasalier run down and the escape of the gas thereby
"prevented."

Second, steadying the gasalier and breaking the velocity of its running down by "the employment of a stuffing box fixed above
"the cap of the water cup, and filled with packing composed as
"follows:—"Of Russian tallow, eight ounces: of castor oil, five
"and a half ounces; of plaster of Paris, six and a half ounces;
"and of rosin, half an ounce; or of white wax, one ounce and a
"half. These are to be reduced by heat, and intimately mixed
"together, when the composition is to be run in a semi-fluid state
"into the boss or reservoir," previously coated with shell-lac
varnish. For pendants with more than one light, in preference,
using a third tube formed with a plunger, upon its upper end;
this plunger consists of two leather washers, "to prevent the
"escape of oil, and as a farther precaution against the escape of
"gas when employing three tubes," using "in the reservoir a
"grease consisting of castor oil slightly thickened with plaster
"of Paris, and a small quantity of rosin or white wax," and in
the casing tube castor oil only.

[Printed, &c. Drawing.]

A.D. 1864, May 7.—N° 1164.

UPWARD, ALFRED.—(*Provisional protection only.*)—"Improve-
"ments in apparatus used for boring and tapping gas and water
"mains, and in fitting service pipes thereto." These improve-
ments it is said are applicable to the apparatus described in
No. 1094, A.D. 1860, and consist in "applying a flexible disc or
"cover of vulcanised india-rubber, or other suitable flexible
"material, around the cylinder, within which the drill and taps are
"situated, and such flexible disc or cover has an opening through
"it to receive a short piece of the junction tube, or a cylinder or
"instrument through which such piece of the junction is passed;
"the end of such pipe of the junction is to be screwed into the
"hole in the main when it has been drilled and tapped, the
"cylinder and other parts of the apparatus being then moved a

" distance, so as to bring the short length of junction tube into
" position to be screwed into the tapped hole, the disc or covering
" of vulcanized india-rubber or other suitable flexible material
" preventing an escape from the main."

[Printed, 4d. No. Drawings.]

A.D. 1864, May 7.—N^o 1166.

WOODWARD, HENRY.—"Improvements in apparatus for
" carburetting gas." These are as follows: having an external
" drum or receiver, in the lower part of which is the reservoir of
" liquid, in this is fitted "a hollow metal disc-like vessel, which
" forms a horizontal diaphragm; the upper surface of this has a
" shallow tray-like recess occupying nearly the whole area. This
" flat hollow vessel is so weighted as to float in the liquid so that
" it may rise nearly to the bottom of the shallow receptacle or
" tray (a little higher or lower, which may require to be regulated
" according to the pressure of the gas) channels of communica-
" tion are made through this flat floating vessel to allow the
" liquid to pass from below up into the tray;" these are filled
" with cotton. The pipe for the supply of gas enters at the bottom.
" The disc or flat drum-like vessel has a cover fixed on it on the
" under side of which cover is a hollow projecting surface rather
" smaller than the tray recess before mentioned, into which it
" dips a little. This surface is studded with minute perforations
" from which the gas is emitted, and which impinges on the
" saturated cottons in the tray below, or it may be on the liquid
" itself over which it travels, passing thence to an annular recess
" between the periphery of the perforated cover chamber and the
" extreme diameter of the tray; from this annular chamber or
" passage it escapes by suitable apertures all round the periphery
" into the upper part of the containing vessel, and passes thence
" by the outlet pipe." "When the apparatus is charged with
" liquid, the floating vessel will rise to the top, and only a small
" portion of the contents will be subjected to the action of the
" gas, the bulk remaining below in a pure state to be supplied
" from time to time to the tray, presenting it to the gas," "the
" floating vessel preserving the bulk from contact with the gas
" passing through the apparatus." A ring is sometimes attached
" to the apparatus to raise it from the ground.

[Printed, 10d. Drawing.]

A.D. 1864, May 9.—N° 1168.

GEDGE, WILLIAM EDWARD.—(*A communication from André Armand Schneider.*)—(*Provisional protection only.*)—"An improved " 'globe' glass or shade for gas or other lights." This consists as follows:—"The globe may be of glass, crystal, enamel, or any other material suitable for lighting. It is pierced with a certain number of holes in each of which "is 'a ring or rim' of metal " fixed by pressure to the 'globe' by means of a spring setting, " which will permit its being placed and removed at pleasure. " In these small rings or rims are set photographs on glass, " crystal, enamel, porcelain, or other suitable material, each proof " being protected from the heat by a piece of smooth or un- " polished glass of the same diameter." "The photographs may " be colored in every shade," and "each opening may be of a " different form."

[Printed, 4d. No Drawings.]

A.D. 1864, May 12.—N° 1200.

PHILLIPS, JOHN.—(*Provisional protection only.*)—"Improve- " ments in the purification of coal gas, and in the application of " the products resulting from such purification." These are, " using bones in any desired condition as a filter for the coal gas, " and such bones absorbing ammoniacal gas," fixing "such gas " by pouring on the bones sulphuric acid, which has a chemical " affinity for the ammonia, or other acids may be used (having " such affinity) to fix the same," thus obtaining "a valuable " compound manure," and "by filtering the coal gas through " bones" it is rendered "much purer."

[Printed, 4d. No Drawings.]

A.D. 1864, May 12.—N° 1201.

PARKER, THOMAS.—(*Provisional protection only.*)—"Certain " improvements in gasaliers; which said improvements are also " applicable to extending and contracting gas brackets." These are, still "using the small concentric tube secured to the base of " the main sliding tube," and, in preference, extended "some " three or four inches more or less above the top end of the " main sliding tube, and to which part the water cup is attached." The top end of the inner concentric tube is tapped, and over it is screwed a small flange, and below this, around the tube,

is applied "suitable fibrous or other packing, preferring to use that material that will absorb oil or any fatty or unctuous matter, and by using a fixed flange at the bottom of the packing, it is evident that the top may be tightened up or reversed so as to become a regulator, for it is essential that this should fit comfortably tight, the interior of the top slide, or that part that is united to the ball or other ceiling joint, as also the part that carries the balance wheels or pulleys over which the chains carrying the balance weights work, which in this case may be reduced in weight to an equivalent of the resistance offered by the packing before referred to." "At the bottom end of the top slide, or any convenient portion thereof below the water cup," a flange is secured "which forms a stop by coming in contact with a projecting flange on the water cup, which prevents the top and bottom slide from separating without unscrewing the water cup, thus making the chandelier at all times secure from falling by the breaking of the chains or other causes." Thus it will be seen that although the use of water or other fluid is purposed and recommended to ensure a perfect joint for gas in pendants and gasaliers "nevertheless" they may be constructed as above without water.

[Printed, &c. No Drawings.]

A.D. 1864, May 13.—N^o 1211.

MYERS, EDWARD, and ROGERS, THOMAS GUY. — "Improvements in wet gas meters." These are, first, in the "arrangement of the float and inlet valve of gas meters," as follows:— "Heretofore the inlet valve has been attached or connected to the stem of the float," and consequently "it has been difficult to ensure the perfect closing of the inlet valve when the water in the meter has sunk below its proper level." These "improvements consist in disconnecting the float from the inlet valve when it is closed, the action of the float causing the upper end of its stem or rod to press upon the inner side of the inlet valve to raise and retain it open whilst there is sufficient water in the meter to cause it to do so. When the float descends the inlet valve is free to close by its own gravity, the stem of the float being only allowed to descend just sufficiently below the under side of the valve, so as to allow it to rest upon its seat when closed, in order that it may come into action again directly the

“ proper level of the water is restored. When the inlet valve is closed the lower end of the stem or rod which passes through and is attached to the float rests on the bottom of the water chamber, to prevent the further descent of the float.”

Second, “ the application of cast-iron, steel, or compound metal plates over the valve box and division plate, in order to prevent the drilling or perforation of this part of the meter for the fraudulent passage of the gas therethrough.”

[Printed, 10d. Drawing.]

A.D. 1864, May 14.—N^o 1229.

BRICOUT, LOUIS.—“ Improvements in apparatus employed in carburetting gas.” These are “ fitting in the bottom of the carburetting vessel,” described in No. 2770, A.D. 1862, “ one or more valves or taps which can be worked from the outside of the apparatus in order to draw off the liquid and impurities when required.” There is a valve at the bottom of each carburetting vessel which draws the liquid and impurities “ into a compartment at the bottom of the apparatus.” This compartment is furnished with two taps; it is also provided with a float to indicate on a dial outside the level of the liquid in the compartment.

[Printed, 1s. Drawings.]

A.D. 1864, May 17.—N^o 1236.

WILSON, WILLIAM.—“ Improvements in and apparatus for generating gas from hydrocarbon or other volatile oils, for illuminating and other purposes.” These are said to relate, first, to certain improvements applicable to an invention described in No. 3023, A.D. 1863, and to consist in “ enclosing or immersing the generator (used in the manufacture of gas by passing atmospheric air over hydrocarbon or other volatile oils) in vessels containing water, sea water, oil, or any other liquid, and further enclosing and covering the tops and sides of such vessels with felt, cloth, flannel, or other bad conducting fabric, or packing the tops and sides of such vessels in sawdust, chalk, sand, or other bad conducting substance,” and also “ applying heat to the bottoms of such vessels for the purpose of raising, keeping up, and regulating the temperature of the liquid surrounding the generators, which source of heat may consist of the flame of a spirit or oil lamp, the flame of a candle or a gas flame

"supplied by the enclosed generators, or from any convenient source."

Second, placing the generators one above another and feeding them from a cistern above, in the bottom of which is a cock which opens into an intermediate reservoir " (which may be of transparent glass in order to see the contents) from whence it is "sucked out by capillary attraction" by means of some suitable fibre down the supply pipe into the generator until it reaches the overflow pipe in the same, when the overplus will descend down into the next generator; and should the supply be sufficient, it will again flow down the overflow pipe and so continue descending through any number of generators. A different degree of heat may be applied to each generator.

Third, "the use and application of a spout or bend provided with a cock or other valve having an annular cup surrounding its mouth which fits into an annular cup on the top of the vessel into which it is desirable to decant the volatile oils, and upon water being poured between them a water-tight joint is made, which prevents the great loss occasioned by evaporation during the process of decantation."

[Printed, 10d. Drawing.]

A.D. 1864, May 18.—N° 1256.

ADKINS, WILLIAM.—(*Provisional protection not allowed.*)—"A new or improved lever wrench or self-adjusting spanner." This consists in constructing wrenches or spanners in "dividing the shank or handle into two parts, and connecting them by a strong joint close to the sliding jaw, while that part of the lever or handle that extends below the joint or fulcrum on which it works forms a cam or curved wedge that forces the moveable jaw more or less in close contact or grip of the nut or screw it has to turn, so that in reality any increased strength or power required to turn the nut or screw, so in proportion is the intensity of the grip on the head of the screw or nut by the cam action of the lever. Thus it will be seen that wrenches or spanners made as herein described are suitable for the smallest or largest work, whether for adjusting and fitting gas fittings, locomotives, and other purposes where strength, space and economy are required."

[Printed, 4d. No Drawings.]

A.D. 1864, May 21.—N^o 1286.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Gustave Bouchery and Jules François le Batteux.*)—(*Provisional protection only.*)—"Improvements in apparatus for increasing "the illuminating power of gas, and for producing gas by the "vaporization of hydrocarbons and essences of petroleum." These are either to increase the illuminating power of gas passed through hydrocarbons or essences from petroleum oils or to produce gas by vaporizing these essences under heat. "The apparatus consists of two cylindrical parts superposed, the upper part "of which is a feed reservoir, and the lower is that in which the "essences are vaporized. The two parts are formed with flanges "at their junction, a packing of leather is interposed, and the "flanges are secured by bolts. The lower cylindrical part consists of a series of compartments which are heated. The air, "&c. enters at the bottom of these compartments and traverses "through them and passes out from the top one. The essences "pass from the reservoirs by means of valves into the first compartment and thence through orifices into the second and so on "to the bottom compartment, in which there is a gauge to show "the level of the essences which have fallen into the lower part "of the apparatus and when they have accumulated to certain "degree they are pumped up into the reservoir at the top." The apparatus may be used not only to produce gas from the essences derived from petroleum oils but for utilizing directly natural petroleum oils, extracting the essences they contain without loss, and leaving as a sub-product an oil fit for burning in lamps with wicks. However, in operating upon natural oils and other matters leaving a residuum, substituting for the plates, &c. a spiral pipe.

[Printed, 8d. Drawing.]

A.D. 1864, May 27.—N^o 1324.

BROCKSIEPER, FREDERICK WILLIAM.—"Improvements in "means for regulating the flow of gas to burners." These are "first, in adjusting the size of the aperture at which the gas "issues from the valve chamber to the burner."

Second, "in an adjustable opening in the valve chamber." In the socket and below the burner is a conical cup, forming a gas chamber. In the centre of this cup is an opening in which is a

conical valve that is suspended from a diaphragm of oil silk, or other suitable material. This diaphragm is made gas tight at its edges by a cap that is compressed upon the same by turning over the upper edges of the conical cup. The valve chamber thus formed is to be pressed tightly to the packing beneath by springs above or by other suitable means. The conical valve hanging from this diaphragm leaves sufficient space around the valve for the gas to pass to the burner; but if the pressure of the gas increases, the gas acting upon the diaphragm causes that and the valve to rise and shut off the inlet opening of the gas sufficient "to preserve the size of the flame and prevent the light flickering." To prevent the pressure closing the valve entirely a screw is introduced into the valve. A screw is also fitted to the orifice admitting the gas to the burner to regulate the size of the opening. A hole is in the cap which allows the gas above the diaphragm to draw in or pass out as the diaphragm rises or falls. A screw may be applied through the socket "with a conical end" whereby the opening to the valve chamber can be regulated from "the outside without removing the burner from the pipe."

[Printed, &c. Drawing.]

A.D. 1864, May 30.—N^o 1330.

WILSON, THOMAS.—(*Provisional protection only.*)—"Improvements in gasaliers or gas slides." These are, first, "supporting and balancing of the sliding part of the gasalier by means of springs instead of weights," as follows:—"On the sole or crown plate by which the gasalier is supported" forming bearings, which receive two or more axes. These axes carry "grooved cone pulleys or fusees similar to the fusee of a watch. The said fusees work loosely on their axes." To each of the axes is attached a flat steel spring. "One end of each spring is fixed at one end to its axis and is coiled round the axis, the other end of the spring being fixed to the fusee by means of drums formed on either side of the fusee. The movable part of the gasalier is connected by cords or chains to the fusees. The axes are turned until the tension of the springs is just sufficient to balance the gasalier when the said axes are fixed and the gasaliers may be raised and lowered by the application of a slight force." "The fusees and springs may be placed at the bottom instead of the top of the gasalier with nearly the same effect."

Second, "in making a gas-tight sliding gasalier without the use of a water or other liquid joint," by attaching "to the end of the fixed tube of the gasalier a ring or piston of vulcanized india-rubber or other elastic material. This elastic piston is forced into the sliding tube of the gasalier," making an air-tight joint.

Third, in the sliding parts of gasaliers, coiling loosely around the tube or slide vulcanized india-rubber or other elastic or flexible tubing, "the upper end of which is connected with the fixed gas pipe of the gasalier and the lower end with the slide of the gasalier." Or "the fixed and moveable parts are connected by means of pieces of elastic tubing one to each branch or light." Or the fixed and moveable parts are connected by means of brass or metallic tubes jointed at the middle.

Fourth, "the use of thin strips of steel for connecting the moveable parts of gasaliers with the counterbalance weights in place of chains ordinarily employed."

Fifth, in case of "the chains supporting the moveable part" breaking, fixing "screw nuts to the ends of both the fixed and sliding tubes, so that the outer tube cannot slide wholly off the fixed inner tube. The nut for the sliding tube is first passed up the fixed tube, and the nut for the fixed tube is screwed on the end of the said fixed tube. The first described nut is then screwed into the sliding tube, and the said sliding tube is then incapable of sliding off the fixed tube."

Sixth, using glycerine or glycerine mixed with water, "in place of water in gasaliers of the kind called water slide gasaliers." The glycerine does not evaporate like water. In using glycerine it has been found convenient "to fix a capped scraper on the top of the external or sliding tube for the purpose of scraping off the glycerine from the inner or fixed tube when the gasalier is drawn down."

[Printed, 4d. No Drawings.]

A.D. 1864, May 30.—N° 1339.

HUGGETT, JOHN.—"Improvements in steam engines, applicable also to pumps and gas exhausters." These are, in constructing a cylinder "in fitting inside it a solid core and piston traversing a central shaft, and in providing inlet and outlet passages." The shaft works through stuffing boxes in the centre

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of the cylinder heads. The inlet and outlet passages may be in the same or opposite heads of the cylinder. The fluid, say steam, entering drives the piston rod round the circular part of the cylinder, and in coming in contact with the excentric part thereof the piston moves through the shaft, both ends remaining constantly in contact with the interior surface of the cylinder. "The steam is only shut off by the piston itself while passing the inlet." "By connecting pipes to the inlet and outlet ports the engine may be used as a pump and as a gas exhauster, the suction pipe being in communication with the liquid or fluid to be acted on."

[Printed, 8d. Drawings.]

A.D. 1864, June 2.—N° 1368.

CORMACK, WILLIAM.—(*Provisional protection only.*)—"Improvements in the distillation or destructive distillation of all solid matters of semi-solid matters capable of yielding fluids or gaseous hydrocarbons, or other products of any kinds whatsoever, be they liquids, fluids, or solids, such as pit coal, boghead, or other bituminous coal, or shale, peat, wood, asphalts, tallow, lard, fats, or other semi-solid matters, and in the treatment of the same." These are "introducing a jet, stream, or current of any atmospheric air, steam or other vapour, gas or gases, singly or combined, superheated or otherwise, into the retorts, ovens, or other vessels, such as are usually employed in their distillation," either above or near the surface of such matters to be distilled, the products come over "at a considerably lower temperature than hitherto accomplished." Also, using "the gaseous products given off from one or more retorts or vessels to be conducted into other retorts or vessels or through a succession of them."

[Printed, 4d. No Drawings.]

A.D. 1864, June 2.—N° 1374.

CLARK, WILLIAM.—(*A communication from Henri Adolphe Archereau.*)—"Improvements in the mode of heating animal, vegetable, and mineral matters, whereby to effect their desiccation, vaporization, decomposition, reduction, fusion, or volatilization, and in apparatus for the same." These are, first, "heating matters in closed vessels free from atmospheric air,"

for the above purposes, "employing as a means of communicating
"the necessary heat, the currents of aeriform substances produced by subjecting such matters to suitable treatment, such as
"distillation, decomposition, reduction, or otherwise; or I may
"surround them with non-oxydizing gases, such as when heating
"faggots or iron, without giving forth any gaseous substances
"or vapours, but which are at same time acted on by the oxygen
"of the air or gases of combustion."

Second, "the mechanical or physico-mechanical means necessary for causing the circulation of the gases and vapours serving
"as vehicles of the caloric, said gases or vapours traversing a
"circuit formed by closed apparatus, consisting, 1st, of spaces or
"chambers in which are placed the bodies to be treated; 2ndly,
"of non-continuous superheating apparatus formed of highly
"refractory materials, and either tubular or non-tubular; 3rdly,
"of continuous apparatus of similar refractory materials (such as
"a cast-iron worm, for example), and also of continuous apparatus of refractory clay, the latter being of tubular form; 4thly,
"of refrigerators or condensing apparatus when the matters under
"treatment require them."

Third, "the use of the system of superheating apparatus," and
"the entire arrangement of apparatus by which is produced a
"circulation of gases or vapours, continually absorbing the
"caloric contained in the several superheaters, and drawn from
"the furnaces or other sources of heat, which is thence imparted
"to the matters under treatment."

In reference to this subject "for manufacturing lighting gas
"from all the sub-products in gas works, by distilling all the
"substances capable of yielding gas," in "this case I employ
"with the distillable material pulverulent substances, such as
"small coke or charcoal." "When it is proposed to obtain gas
"from American petroleum oils, I take the products of distillation
"direct from the distilling apparatus, which products being
"already heated, and in a state of decomposition, it would be
"useless to cool and have afterwards to re-heat them, causing a
"loss of heat, which it is better to prevent. The condenser in
"this case serves only to cool the gases obtained. If this decomposition is perfect, there will not remain any solid or liquid
"matters to condense, and if imperfect it will be necessary to
"cause the volatile products to pass through another superheater"
"placed between the distilling apparatus and the refrigerator or

" condenser," or a series of superheaters may be employed. In producing lighting gas on a large scale, "when convenient I sink in the ground as much as possible the vessels or capacities, in which are placed the materials to be distilled, as also the superheaters whatever may be their construction, but principally such as consist of chambers filled with materials taken generally from those which have refractory properties and great affinity for heat," using "all possible sources of heat," and operating "at any temperature."

[Printed, 2s. 2d. Drawings.]

A.D. 1864, June 9.—N^o 1436.

HENRY, MICHAEL.—(*A communication from Henry Giroud.*)—"Improvements in gas regulators, also in gauges and clocks." These consist in "a gas regulator in which the gas supplied to the burner in excess of combustion is the agent of its own regulation." The regulating gas is preferably taken at the part of its passage at which it flows faster than it is consumed, and it is returned to the holder by a return pipe having no outlet save at the ends, so that this return gas signalizes the state of pressure." "In one arrangement the gas pipe which leads into a chamber containing water, is opened and closed by a conical plug suspended from a bell-crank weight or lever, worked by the gas as it flows into the chamber through the return pipe, and stops when the pressure is in equilibrio; the pipe of the pulley corrects variation of weight due to different degrees of immersion. The float may be of truncated cone form. The apparatus will indicate leakage. Immersed floats or plungers may be used" or "a counterbalance weight may be used, the effect of the truncated cone being replaced by a compensation pipe, or by suspended metal plates, following the motion of the float and counterbalancing it. The vessel in which the float plunges may extend to the upper transverse side pipe, water being admitted through a hole closed by a nut or ornament." "In another arrangement the gas flows to the service pipe through a chamber and rises in an equilibrium pipe, whereby the counter pressure is balanced. To regulate the pressure of gas in the service pipe it expands in a chamber." "In an arrangement in which electricity is used the return pipe leads under a float held in a cylinder, and suspended from which carrying two

“ needles moved at the ends of a horizontal diameter by the float,
“ as the pressure varies they communicate with an electric wire,
“ and as the wheel turns exert friction against a dial formed of
“ two semicircles at each side of the diameter. When the pressure
“ is in equilibrio the needles are brought against contact breakers,
“ but when the pressure varies they send a current to the semi-
“ circles which are in electric communication, by line wire and
“ earth wire, with clockwork moved by a weight, and raising and
“ depressing the spindle of a supply valve. When contact is
“ broken the wheelwork is held by a stop, which the pressure alters,
“ this is removed by electro-magnets, the valve spindle is put
“ into gear and the valve opens till equilization of pressure again
“ breaks contact. The needles may transmit the current to bells
“ or alarms.” “ A gauge may be constructed by placing on the
“ axis of a dial a beam on which is a thread stretched by a weight
“ and carrying a bell or plunger, at the centre of which a disc is
“ supported by a rod passing through a pipe through which the
“ fluid to be measured flows from a chamber. A pipe wider than
“ the fluid pipe is used to compensate for alteration of level; it
“ communicates with the chamber so that the same pressure is
“ produced as in the bell. The compensation pipe is filled with
“ wire or pieces of metal to make up the difference of the pipe
“ diameters, whereby the position of the pointer on the dial will
“ be regulated.” “ For measuring time the gas regulated as
“ described is conveyed through a meter communicating by its
“ wheel with the minute hand of a clock, and resting on a float
“ on a vessel of water whereby regular movement will be trans-
“ mitted to the hands. Instead of gas, air may be used, under
“ pressure, or air or gas alternately by a two-way cock.” Other
modifications of some of the above apparatus are described.

[Printed, 8d. Drawing.]

A.D. 1864, June 10.—N° 1447.

SIEMENS, CHARLES WILLIAM.—(*Provisional protection only.*)
—“ Improvements in apparatus for producing combustible gases,
“ part of which improvements are applicable for indicating the
“ pressure of gases and fluids generally.” These are said to have
for their object “ the entire conversion of the combustible matter
“ in coal or other fuel into gases suitable for heating and lighting
“ purposes. For this purpose the fuel is made to descend gra-

“dually through one or more vertical or inclined retorts formed
“of cast-iron, fire-brick, or other suitable material, and is
“made to pass from the lower end of such retort or retorts over
“or upon a fire-grate, where it enters into combustion. The
“thickness of the layer of fuel upon the grate being compara-
“tively large, the oxygen of the atmospheric air which enters
“through the grate, takes up sufficient carbon to form carbonic
“oxide.” The mixture of gases “resulting from this combus-
“tion passes round or over the external surface of the retort
“through which the fuel descends, and imparts sufficient heat to
“the same to effect the partial or entire carbonization of the fuel
“during its descent; the gases thereby evolved in the retort
“also descend to the foot of the same, where they mix with the
“carbonic oxide and other gases which are generated upon the
“grate. Or the gases generated in the retort may be con-
“ducted away separately, and may be rendered available for
“illuminating or other purposes.” “The efficient working of
“this apparatus depends in a great measure upon an accurate
“adjustment of the pressure in different parts of the apparatus.”
“These differences of pressure are so exceeding small that none
“of the existing pressure gauges would indicate them.” This is
effected by attaching to the apparatus at different parts a syphon
pipe of glass, each leg of which terminates in a bulb or reservoir,
one of which communicates with the interior of the producer; the
lower portions of the syphon contain one liquid, and the upper
portions another liquid, which will not mix, and colored to dis-
tinguish them easily, and a scale to read off the pressure.

[Printed, 4d. No Drawings.]

A.D. 1864, June 13.—N^o 1456.

SHARP, WILLIAM.—“Improved means or apparatus for puri-
“fying and increasing the illuminating power of gas.” This
consists of a vessel, by preference cylindrical, one end closed,
“forming a bottom a little concave, with a recess to receive im-
“purities, and a tap or valve to draw them away.” The other
end or top is flanged, and a lid is provided so as to make the
vessel gas-tight. “To the under side of this lid is a tube or
“cylindrical chamber extending to near the bottom of the vessel
“open at its bottom end, and a partition is placed betwixt the
“outside of this tube and the inside of the vessel, dividing the

" annular space thus formed at one point. An inlet pipe is provided on one side of the partition, and an outlet pipe on the other. A diaphragm is placed near the top of the vessel, perforated to receive and suspend the wicks of fibrous substances filling up the annular space. A float is placed within the tube connected to a valve or tap for regulating the supply of carburetting fluid, which may be supplied by a pipe from a cistern or cask placed in any convenient position at a slightly higher level; or, instead of a float in the tube, a flanged disc or cover may be placed in the supply cistern in a small reservoir of quicksilver, and connected to a valve at the inlet end of the supply pipe; also a pipe communicating from the upper part of the supply cistern to the carburetting vessel, the end of which is adjusted to the intended level of the liquid, so that when the liquid lowers in the vessel below the end of the pipe, gas will flow up into the supply cistern above the liquid and under the disc, the pressure of which lifts the said disc and opens the valve of the supply pipe; and when the liquid is raised in the carburetting vessel so as to immerse the end of the gas pipe, the passage of gas is stopped and the disc lowers, closing the valve and stopping the supply."

[Printed, 10d. Drawing.]

A.D. 1864, June 15.—No 1473.

O'NEILL, PATRICK BENIGNUS.—"Improvements in sluice and other casks, valves, and taps." In the Provisional Specification these are said to be, in reference to this subject, first, "to supply a more effective apparatus for opening and closing large and small pipes and ducts for the passage of," among other things named, "gas and other fluids and vapours," also, "to render such opening and closing media, or any of them capable of being used as meters." In the "opening and closing media above mentioned" it is proposed "to introduce a new form of plug," "modifications of which may be used in almost all cases, I make hollow, and of a cylindrical, conical, or rectangular and tapering shape externally, such forms respectively being either entire or segmental as circumstances may require."

Second, in taps generally, making the plugs "so that a full way not only of the same area but of the same shape or transverse section as the pipe, trunk or main is preserved," by which a better

flow is obtained, and the taps "act as meters for indicating the quantity of liquids or vapours passing through them." One form proposed "to adopt as a meter, consists of fore and aft cylinders, pipes, or cones, between which I insert an enlarged chamber," in which is fitted "a vaned wheel, the vanes of which exactly fit the chamber, but do not touch at the peripheries." This wheel, on turning through its axis "motion may be given to a train of wheel-work or other mechanism by which the quantity of fluid passing through the chamber may be ascertained."

In the Final Specification it is said that the first part of the Invention is for supplying "more effective apparatus for opening and closing pipes and other similar ducts for the passage of water, steam, gas, and other fluids and vapours, for opening and closing vessels containing liquids, and for more effectively securing the contents thereof, and also for measuring and registering or indicating the quantity passing through the said apparatus;" and the second part "is to remedy the leakage, and otherwise improve the form and construction of parts of similar apparatus as at present made, and to render the same less liable to derangement and injury when in use," and the construction of several cocks, valves, or taps is given, but these described appear to relate to fluids or steam.

[Printed, 2s. 6d. Drawings.]

A.D. 1864, June 16.—N^o 1495.

DAY, JOHN.—(*Provisional protection only.*)—"An improvement or improvements in sliding gasaliers." This consists as follows:—"In the ordinary sliding joint the sliding tube works within the fixed tube;" in this "the sliding tube works upon the fixed tube, the packing of the tubes being effected," as follows:—"On the upper end of the sliding tube is a cylindrical chamber of somewhat larger diameter than the sliding tube and of two or three inches in length." In this chamber "is a cylinder of compressed cork fixed therein by collars at top and bottom. The fixed tube passes through a hole in the axis of the said cylinder of cork, the said fixed tube fitting accurately the said hole and working gas-tight therein, but owing to the small surface of the tube in contact with the cork it moves with very little friction. The cork is saturated with oil or other lubricant. The bottom of the fixed tube is provided with a

" flange or check to prevent the falling of the sliding parts of
" the gasalier in case the chains of the balance weights break."
Although a cork cylinder is preferred, " yet a series of leather or
" felt washers or other packing material may be employed, so as
" to form a very nearly similar packing. The sliding tube and
" parts carried thereby are balanced by weights as in the ordinary
" water slide gasalier." " In some kinds of gasaliers the arrange-
" ment of tubes described is reversed," that is, the tube described,
" as the fixed tube is the moveable one," and that which is
described " as the moveable tube is the fixed one."

[Printed, 4d. No Drawings.]

A.D. 1864, June 16.—N° 1499.

NEWTON, GEORGE, and BRADDOCK, JOSEPH.—" An im-
" proved compensating gas meter." In wet gas meters " having
" a vessel or chamber containing water, acting on the prin-
" ciple of a bird fountain, and called a compensating water
" box." Instead of placing the float in the fountain, placing it
in the inlet chamber or front box, and also connecting " to the
" same chamber the air tube and the orifice for supplying water
" to the meter from the fountain, which arrangement is for the
" purpose of maintaining the water in the meter at a constant
" uniform level, for if by the evaporation or other loss of the
" meter the bottom of the air tube becomes unsealed, the pres-
" sure of the gas acting on the water in the compensating box,
" allows the water to pass through the orifice from the com-
" pensating box to the inlet chamber of the meter until the water
" attains its correct level, when the air tube will be again sealed.
" By this arrangement of placing the float, air tube, and orifice
" for the supply of water from the compensating box in the inlet
" of the meter, this system is applicable to ordinary wet gas
" meters."

[Printed, 10d. Drawing.]

A.D. 1864, June 17.—N° 1513.

TOOTH, WILLIAM HENRY.—" Improvements in furnaces or
" apparatus for generating carburetted hydrogen, carbonic acid,
" carbonic oxide, and cyanogen gases." These are as follows :—
" A large chamber having a wrought or cast iron outer casing
" lined with fire-bricks or other suitable material," is " divided

" by a perforated dome or arches placed two or three feet from
 " the bottom, into two compartments, consisting of an upper and
 " lower compartment. A suitable number of fire-places, accord-
 " ing to the size of the furnace, are placed along the outside of or
 " near the bottom of the chamber, so that the heat and gases
 " generated in the fire-places will completely envelope the inner
 " chamber and will decompose the atmospheric air supplied to
 " produce combustion in the fire-places." "The fuel in the fire-
 " places is separated from the lower chamber by bridges, which
 " cause the flame and gases from the fire-places to ascend and
 " thoroughly commingle together and produce complete combus-
 " tion (as nearly as possible) before descending over the bridge
 " into the lower chamber and passing through the perforations
 " into the upper chamber. The upper chamber is fitted with
 " valves at the top and doorways in the sides for charging and
 " discharging. It is also provided with suitable pipes and valves
 " from which the gases can be conveyed away to gasholders,
 " reservoirs, or exhausters, or to the furnaces where it is to be
 " employed." To produce carburetted hydrogen for lighting, or
 " combined with carbonic acid to be used in smelting, the upper
 " chamber "is charged with coals until it is about four-fifths full."
 "The fire-places are charged with coals or coke, and a blast is
 " forced into them and the valves are regulated. To manufacture
 " cyanogen, the carbonaceous matters are saturated with a solution
 " of an alkaline carbonate and dried.

[Printed, 10d. Drawing.]

A.D. 1864, June 22.—N^o 1561.

JONES, JOHN.—"Improvements in dry gas meters, parts of
 " which are applicable to apparatus for regulating the flow of
 " air." These are, first, "dividing the chamber or body con-
 " taining the diaphragms in a diagonal direction, and not across
 " as heretofore; the division may extend from either angle to the
 " opposite angle," as desired.

Second, "hinging the discs carrying the diaphragms at or near
 " the sides of the case. The hinges work in sockets, and carry
 " arms or plates which are connected to the discs carrying the
 " diaphragms, and, as it were, grasp them at or about their centre,
 " so that the diaphragms open and shut in an even and steady
 " manner about one point, and that the hinge." By thus hinging

the diaphragms, meters are enabled to be constructed "of much less size than heretofore, and to dispense with the guides and other appliances usually used for causing the diaphragms to work steadily and evenly," and at the same time reduce the friction. The case being "divided diagonally, renders it necessary to place the levers in connection with the hinges on each side or at opposite angles of the case, and these are jointed to other levers for communicating motion to the valves and index." In preference, the gas is conducted "from the meter through a box to the outlet pipe. The levers and arms are made of, by preference, noncorrosive metal."

Third, fitting a box, afterwards described, to apparatus made similar to dry gas meters generally, but in preference, to the meter before described, so as "to pass and at the same time to regulate the flow of air over volatile oils to render them more suitable for burning purposes. This box contains, by preference, two passages in communication with the ports of the valves and the outlet pipe; apertures are made in each passage and valves are fitted thereto, motion being communicated to the crank and thence to the diaphragms by clockwork" or otherwise.

[Printed, 8d. Drawing.]

A.D. 1864, June 25.—N^o 1602.

DENIS, CHARLES.—"Improvements in gas-heating or cooking stoves." These are, first, the construction of a heating or cooking gas stove composed of a chamber or chest entirely closed at the bottom and surrounded outside by gas pipes or tubes connected with the running feed pipe, the "surrounding gas tubes being at a little distance apart from the chest, and fitted with small caps or burners screwed fast into them in the direction of the sides of the chest or chamber, which has itself small apertures corresponding to each burner through which the blazing gas rushes, and by its rarefying the internal air causes a suction, by which the outside air is made to rush in the chest, and by its running around the burning gas to become heated and mix with the gas, increasing its combustion and producing a greater degree of heat." The chamber has a covering piece cut out with holes for the escape of vapours arising from the cooking of meat; at the bottom of the chamber is a dripping pan with an aperture at the bottom for the gravy to run out.

Second, "the application of the said stoves to cooking, heating, or industrial purposes, by modifying them according to requirements."

[Printed, 10d. Drawing.]

A.D. 1864, July 1.—N^o 1638.

DANCHELL, FREDERICK LUDEWIG HAHN.—"Certain improvements in apparatus, by means of which, air, gas, or vapour is to be removed from tubes, pipes, tunnels, pans, retorts, or other vessels." These are, employing a narrow orifice of pipes or a series of pipes through which steam in form of a jet or jets are passed, conducting the said jet or jets into a tube or series of tubes, the one end of which is connected with the air or gas holder intended to be exhausted, whilst the other end is left open to the atmosphere or to a vessel or vessels into which is required "to conduct the air, gas, or vapour thus exhausted. The relative size of the said orifice, and the tube or tubes, together with the pressure of steam, forms the condition of the greater or less exhaustion, or greater or less current thus produced, that is to say, the less the difference between the size of the said tube and orifice, and the greater the pressure of the steam issuing from the said orifice, the greater is the effect produced."

[Printed, 6d. Drawing.]

A.D. 1864, July 5.—N^o 1668.

LLOYD, WILLIAM.—(*A communication from William Henderson.*)—"Improvements in the manufacture of hydrocarbon gas, and in apparatus employed therein." These are, "introducing dry steam to the retorts containing the coal or other substance heated to their own intensity," and "constructing retorts for the manufacture of gas," as follows:—The retorts are of the ordinary description, with "the addition of a false bottom to each about three-quarters of an inch less in width than the retorts," in which are "side ribs resting on the bottom of the retort, raising the plate itself about one inch and a half from it. The space between the plate, and sides, and back end of the retort are filled with cement making it perfectly tight. Fire-clay retorts are preferred, with false bottoms of the same material." There is no alteration in the setting, &c., only substituting a steam boiler for the uppermost retort or retorts. "A steam pipe pro-

“ceeds from the steam space of the boiler and branches to each retort, severally supplied with steam valves for governing the admission of the steam. The retorts are charged alternately and the steam admitted between the bottoms of that retort in which the charge is most incandescent, proceeds down the one side of the space between the bottoms, and up the other by a communication at the back end, where it is heated to the same degree of temperature as the retort, and emerges in that state at the front into the incandescent charge therein contained, through which it is compelled to travel, becoming thoroughly decomposed by the red-hot coke, and enters by a back connection the other retort charged with coal in a bituminous state, where it takes up the proper equivalent of carbon to convert it into a permanent illuminating gas, and escapes by the ascension pipe to the hydraulic main.” “In each ascension pipe there is a valve fitted, connected by a lever, and so arranged that the closing of the one opens the other.

[Printed, 8d. Drawing.]

A.D. 1864, July 14.—N^o 1758.

BERNAYS, JOSEPH.—“Improvements in apparatus for raising and propelling water, air, and other fluids and gases, and in driving gear for the same, which latter is also applicable to other purposes.”—These are, first, “relieving the external surface of both discs of rotary pumps or fans more or less entirely from the pressure of the water, air, or other fluid or gas in the delivery pipe, by making the annular passage or channel that receives the fluid from the revolving discs fit as closely against the side or end circumference of such discs as is compatible with the free motion of the same, so as more or less entirely to prevent the pressure of the fluid or gas existing in such passage or channel from being communicated to the fluid or gas surrounding the side surfaces of the rotating discs.”

Second, “constructing double flat valves without a central bridge, and making the valves to form a water-tight joint between their meeting edges by the elastic edge of one valve being pressed against that of the other valve by the column of fluid resting upon the valves.”

Third, “constructing driving gear of two pullies having each two or more grooves, round which an endless cord, rope, band,

“ or gut is caused to travel with or without the aid of one or more guide pullies.”

[Printed, 1s. 6d. Drawings.]

A.D. 1864, July 14.—N° 1759.

CROLL, ALEXANDER ANGUS.—“Improvements in the manufacture or preparation of material for the purification of gas.” These are as follows:—Sulphuric acid, in preference “of a specific gravity of about 1,700° or higher, at a temperature of about 270° Fahrenheit, or at such a temperature as can be obtained, having reference to the degree of concentration of the acid employed,” is combined “in the proportion of about two parts by weight thereof to 1 part by weight of any sawdust, but varying the proportion with the absorbing power of the sawdust,” using “by preference sawdust obtained from soft wood, or such as possesses the largest absorbing power. The matters thus obtained are to be used in what are known as dry lime purifiers.”

[Printed, 4d. No Drawings.]

A.D. 1864, July 16.—N° 1792.

EBDY, THOMAS CHARLES, and BURDON, MATTHEW.—(*Provisional protection only.*)—“Improvements in the means of, and apparatus for lighting and extinguishing gas lamps.” These are, employing “around and below the burner of the lamp four, or more or less, pieces of soft iron or any other metal or metals coiled around with insulated copper wire or other conducting wire after the manner of constructing electro-magnets, such wire being connected by suitable connecting wires to the positive and negative poles of a galvanic battery or other generator of electricity. The wire from one magnet in a lamp passes down the post and along the earth, or from lamp to lamp, above ground to the next lamp, and so on, and is either conducted ultimately to the battery, or the circuit is completed by the earth. Below the magnets are placed sliding armatures, so that when the current is established they rise to the magnets and carry a pinion on a wheel upwards, thus turning on the gas tap in connection with the wheel. Another slide above the armatures moves a spiral wire around the tube of the burner in connection with a platinum wire extending to the top of

" the burner. This platinum wire is rendered red or white hot
" by the passage of the electric current, and ignites the gas."
" To extinguish the whole series of lamps the current is cut off,
" the armatures, the slides, and spiral wires fall simultaneously
" by their own weight, the tops become shut off, and the lamps
" extinguished."

[Printed, 4d. No Drawings.]

A.D. 1864, August 4.—Nº 1950.

MARCHISIO, GIACOMO FELICE.—" An improved apparatus for
" generating inflammable air for illuminating and heating pur-
" poses, and supplying the same to burners." This consists " in
" the general construction, arrangement, and combination of
" apparatus," and " the application and use of a rotating agitator
" arranged and operating " as follows :—This consists of a metal
" case, in preference of a cubical shape, " divided into two compart-
" ments placed in communication by means of a tube provided
" with a valve. The first compartment is subdivided into two
" divisions; one of these divisions contains the slide valves and
" the other apparatus for giving movement to the bellows herein-
" after mentioned, and regulating the entry of the air; the other
" division contains a pneumatic apparatus consisting of two or
" more bellows, independent of each other, all being in com-
" munication with the valves above-mentioned. Each bellows
" alternately draws in and expels the atmospheric air, which is
" thus transmitted to the second compartment as it is required.
" This compartment contains an apparatus for agitating the
" paraffine oil, petroline, naphtha, benzol, or other hydrocarbon
" placed in this compartment, and causing it to be taken up by
" or combined with the atmospheric air of the chamber. The
" air, being thus impregnated with inflammable matter, passes
" on through suitable tubes to the burner, where it is consumed.
" A spring or weights may be used to set the apparatus in motion,
" or the small power required may be obtained from the atmo-
" sphere. On lighting one of the burners a current of inflam-
" mable air is continuously supplied, and to repair the consump-
" tion at the burner the required quantity of atmospheric air
" enters the first compartment, and is passed into the second by
" the means before described."

[Printed, 1s. 2d. Drawings.]

A.D. 1864, August 17.—N° 2044.

DALZIEL, WILLIAM.—“Improved apparatus for regulating the “ pressure and supply of gases or elastic fluids.” This consists as follows:—The gas under high pressure is kept stored in a strong rigid metal holder or vessel capable of resisting a considerable internal strain, and communicating by means of a pipe provided with a suitable valve with a moveable metal holder like an ordinary gas holder working in a hydraulic joint, and it may be “ counterbalanced by weights so as to give any desired pressure “ in the exit pipe leading therefrom to the burners.” The aforesaid valve “ is commanded by a lever, which is connected by a “ link or rod, or in any other convenient manner, to the moveable “ or low pressure vessel or holder, so that as this holder rises and “ falls it will act on the valve and allow more or less gas to pass “ from the high pressure to the low-pressure vessel or holder.” The gas holders may be of any shape “ adapted to the railway carriage.” The aforesaid valve “ is a slide valve, in the lower “ part of which is made an angular or Λ -shaped opening. The “ face of the valve is ground to fit the exit aperture, which may “ be made of a triangular shape, so that the V-shaped opening “ in the slide may at first admit only a small rush of gas, and “ afterwards, as the valve rises, the area of the supply will be “ increased gradually and as the valve descends the supply will “ be rapidly cut off.” In preference this kind of valve may be used, but “ other forms of valve may be used.”

[Printed, 10d. Drawing.]

A.D. 1864, August 18.—N° 2050.

PARKES, JOHN JOSEPH.—“Improvements in the application “ of gas and other fluids or liquids for lighting and other purposes, and in apparatus connected therewith.” These relate to a means of applying gas on railway lines in tunnels or elsewhere for the temporary lighting of places for repairs or other purposes. A gas main is run below the permanent way, and at distances of 50 or 60 feet are short tubes with gas valves enclosed in a hollow block forming a seat, and fitted with a cover. A central spindle projects from the upper part of the valve on which fits the lower end of a key or standard for turning on or cutting off the supply of gas. The stem forms a temporary stand pipe, and is surmounted by a cross tube with valve openings at the ends; on one

or both ends of this cross tube may be secured flexible tubes of any length with gas jets or nozzles at the ends, and these are suspended on hooks carried on iron rods so as to be fixed in the ground at any point of the work. "The valve, which is of cylindrical form, is furnished with suitable flanges securing the parts together, and all being bevilled wherever any dirt might otherwise effect a lodgment." "The gas finds passage at the lower part through suitable orifices made in a central screwed stem or part of the valve up into the spindle, which orifice remains covered at top so long as the gas is turned off by the screwed boss on which the key before described fits, and at bottom by a plate acted on by a spiral spring, so that there can be no escape of gas possible, the contact surfaces being further furnished with suitable packings to ensure such object."

[Printed, 10d. Drawing.]

A.D. 1864, August 19.—N° 2058.

ALBRECHT, CHARLES EDMUND. — (*Provisional protection only.*)—"Improvements in apparatus for the admission, exclusion, and regulation of gas supplied to dwelling houses and other structures." These are, connecting "the key, tap, cock, or valve of the meter or inlet, or supply or service pipe with a cord, chain, wire, or other like agent carried through the ceilings, walls or otherwise to the various floors or apartments," "being combined for that purpose with rollers, pulleys, or cranks, and having a weight at both ends, so that by moving the cord or like agent, the key, tap, or valve will be worked, and the gas admitted, excluded, or regulated as required; or instead of a weight or weights, springs, screws, or equivalent contrivances may be used. A graduated disc or scale may be used to allow of the inflow being regulated to a nicety." By these means the gas may be instantly turned off without going "to the meter, and in case of fire, the severance or burning of the cord will almost instantaneously turn off the gas."

[Printed, 4d. No Drawings.]

A.D. 1864, August 24.—N° 2092.

PILKINGTON, RICHARD.—"An improvement in gas burners." This consists in "constructing and employing in connection with the upper portion of the burner 'from which the gas issues,' a

" crown-shaped projecting wire or staple secured thereto through
" the medium of vertical slots formed in the sides of the burner,
" by which arrangement the said wire is caused to bisect the
" lower portion of the flame longitudinally therewith, and admit
" of being renewed at pleasure when worn or otherwise rendered
" useless."

[Printed, 8d. Drawing.]

A.D. 1864, September 2.—N° 2152.

WALTER, EDWARD MILLER.—(*Provisional protection only.*)—
" An improved gas valve and regulator." This consists as
follows :—A chamber is made " to hold quicksilver by inserting
" one iron tube into another of greater diameter, and joining
" them together at one end, so as to form a closed bottom to the
" space contained all round between them." The inner tube is
left shorter, and remains open throughout from top to bottom,
and forms the inlet gas way to the valve. In the side of the
outer tube, about on a level with the top of the cone, an aperture
is made, to which is attached a mouthpiece to receive the junction
pipe destined to convey the gas to the burners after passage
through the valve. The space between the two tubes is filled to the
requisite extent with quicksilver. An inverted cylindrical plunger,
closed at the upper end is made of a piece of iron tube, the upper
end is fixed to a rod by which it is raised and lowered, and capable
of fitting down in the form of a cap over the open top of the
centre tube or core. An aperture is made " in the side of this
" plunger corresponding in size and in vertical position to that
" in the outer tube, so that every time the plunger is raised the
" aperture therein comes opposite to that in the outer tube. The
" gas is turned off by making the plunger to descend in the
" vessel of quicksilver till its aperture is submerged therein, when
" the flow of gas becomes thereby arrested. It is turned on by
" raising the plunger out of the quicksilver till its aperture is
" uncovered and stands opposite to the aperture in the outer
" tube." " The rising motion of the plunger is effected by a
" system of bell wires; the falling motion is secured by the
" weight merely of the plunger without any other aid or force."
" A frictional contrivance is applied to the handle, and this
" enables it to govern the rising and falling movements."

[Printed, 4d. No Drawings.]

A.D. 1864, September 13.—N° 2237.

DURFEE, ZOHETH SHERMAN.—“Improvements in apparatus for generating gas for fuel, and in furnaces for applying gaseous fuel to metallurgical and other operations.” These are, first, the gas generator consists of a chamber with a grate at its bottom. The generator is of iron, as also are the flues which encircle it. This generator is fed through a hopper with fuel from its top, which is covered with a revolving plate of iron. At the top of the generator an open-mouthed vessel is suspended much smaller than the generator, “so as to allow a good supply of fuel being maintained between it and the walls of the generator.” It has pipes near its top leading out through the walls of the generator for carrying off the gases. The walls of this vessel, from its mouth to a height somewhat below that at which the fuel is maintained, are perforated with numerous holes tapering outwards, for drawing off the gases from the surrounding fuel as speedily as possible.

Second, in the furnace for burning the gases made in the generator just described, employing a series of perforated diaphragms, as follows:—The first or inner diaphragm in the top or sides of the furnace is a wall or roof of fire-brick, or other suitable material, perforated with a series of small holes or tuyers. Parallel with this diaphragm, and intermediate between it and the next or second diaphragm, is a chamber, called the gas chamber, in preference, of cast iron, into which the gaseous fuel in its way to the furnace is admitted in any convenient way. This second diaphragm has a number of tuyers projecting from its inner or lower surface towards the corresponding holes in the first diaphragm, and the projections are of such length and form that the second diaphragm may be moved towards the first without “injuriously interfering with the flow of gas through the gas chamber to the holes in the said first diaphragm.” “Above, or without the second diaphragm, and working freely in suitable guides backwards and forwards, is a third diaphragm,” containing “a number of steel or other elastic rods equal to the holes in the second diaphragm, into the main part of which holes they work loosely, and to the outlets of which they act as valves. This third diaphragm has a large number of holes pierced in it for the free passage of air or gas through it to the second diaphragm. Over these diaphragms is an air-tight cover of cast or sheet iron or

" other material, but provided with suitable inlets for the sup-
 " porters of combustion which are to be used in connection with
 " the gaseous fluid admitted to the gas chamber." The second
 " and third diaphragms may " be moved by suitable levers or appli-
 " ances attached to and worked outside the cover. When these
 " diaphragms are enclosed in casings or segments, the wall of
 " such casings or segments may be made hollow to provide for
 " the passage of some cooling elements through them." Modified
 arrangements of the above apparatus may be employed.

[Printed, 2s. 2d. Drawings.]

A.D. 1864, September 16.—N° 2259.

CAFFERATA, JOSEPH RAPHOEL. — (*Provisional protection only.*)—"Improvements in gasaliers." These are, "in a cer-
 " tain mechanical arrangement to prevent accidents through the
 " sudden falling down of the gasaliers." There is a frame
 " termed the 'catch frame' which may be made of brass, iron, or
 " other suitable metal, the same being perforated with a hole of
 " the same diameter as the inner tube, and fastened by screws
 " or rivets; or otherwise, securely attached to the cup-shaped top
 " of the outer tube to which the balance chains are attached.
 " The said 'catch frame' contains a hollow slit, within which are
 " two clips or catches, one at each side of the inner pipe made
 " of brass, iron, or other suitable metal, which are continually
 " pressed towards each other, and so grasp or hold the inner gas
 " pipe by means of two steel springs, the said springs being
 " retained in their places within the hollow slot of the 'catch
 " 'frame' by means of their elasticity. The said catches project
 " a little beyond the outside edge of the 'catch frame' and are in
 " this projecting portion furnished with a slit in which works an
 " oval or elliptical wheel, herein-after termed the lever wheel,
 " which said 'lever wheel' may be made of brass, iron, or other
 " suitable metal, and attached by a pivot or axle to the outside
 " edge of the aforesaid 'catch frame' in such a manner as to be
 " able to turn freely in either direction. Near one end of the
 " transverse axis of the said 'lever wheel' is attached a chain,
 " which on being pulled causes the aforesaid 'lever wheel' to
 " partially revolve, and in so doing press back the above-named
 " clips or catches, and so release the inner tube and permit the
 " gasalier to descend when it may be necessary to lower it. The

" said chain, which must be of the same length as the gasalier,
" should be made to pass through a small pipe, so as not to come
" in contact with the water which is usual in sliding gasaliers."

[Printed, 4d. No Drawings.]

A.D. 1864, September 20.—N° 2310.

SMITH, EDMUND.—"Improvements in wet gas meters." These chiefly relate to the following method of conducting the inlet gas into the syphon pipe and drum. A communication is made " direct from the valve box into the waste water box, to which the " syphon is fixed." "In order to work the inlet valve from the " exterior of the pipe," the float wire is attached to a vibrating spindle, to which the valve is fixed; the vibrating spindle is fitted " gas tight in or through the inlet valve box or chamber. When used with a compensating meter two floats can be attached to the vibrating valve spindle, one float being submerged in the supply reservoir, and the other in the water in which the measuring drum works. In this case the inlet valve is hinged to a spindle working through the valve box, on the outer end of which spindle an arm of a lever is attached, carrying at its outer end a float, the position of which is regulated by the float rod being screw-threaded, and its passage through an eye formed in the end of the lever. From this lever another lever or rod depends, passing through a guide secured to the frame and carrying a float at its lower end. Thus the inlet valves and floats move simultaneously. Where only one float is used the valve spindle is hinged as before, and the screw-threaded pin is passed " on the float through a " loop on the end of the lever, whereby its distance from the " valve is rendered longer or shorter as desired. The water level " in the supply reservoir is regulated by an aperture in the inlet " gas pipe, a seal being fixed to the side, so that no gas can " escape until the submerged float has acted upon the inlet valve " and stopped the supply of gas. The method of regulating the " water line in the inlet gas pipe can also be adapted in non-compensating meters, in which case it will of course be in the " same water as the measuring drum. Water is introduced by a " pipe leading from the top of the case direct to the measuring " drum."

[Printed, 8d. Drawing.]

A.D. 1864, September 21.—N° 2320.

YOUNG, EDWARD.—(*Provisional protection only.*)—"Improve-
ments in the manufacture and application of fire-resisting
cements and materials," consisting in the employment of titan-
ic acid, or of ores of titanium in the manufacture of fire-bricks and
cements. The ores are first powdered and then mixed with gan-
ister or powdered silica, and on being moistened with milk of lime
the compound is moulded into shape and then burnt in the usual
way. The ores of titanium may be used in combination "with
carbon, steatite, or alumina, or other silicates of alumina,"
and moistened with water only or water and potash or fluor spar.
The material may be used for retorts, blast furnaces, tuyer pipes,
Bessemer converters, cupolas, forges, and fire-bricks generally,
and it may be used unburnt as a plaster or cement for lining
furnaces, &c.

[Printed, 4d. No Drawings.]

A.D. 1864, October 7.—N° 2472.

HASELTINE, GEORGE.—(*A communication from Benjamin Franklin Penniman.*)—"An improved process for purifying coals
and ores." In order to remove sulphur from coal, or ores of
iron, or other minerals, the minerals are placed in a closed tank or
retort, and are mixed with acid or alkaline agents, and subjected
to the action of steam for a few hours. The tank is then cooled
and the water is drawn off. With a ton of ordinary soft coal are
mixed of caustic soda, 1 lb.; carbonate of soda, 3 lbs.; nitric
acid, 2 ozs.; borax, 1 lb. These proportions may be varied and
other equivalents used for the materials mentioned. By means of
this invention impure coal may be freed from sulphur and rendered
available for the manufacture of gas.

[Printed, 4d. No Drawings.]

A.D. 1864, October 10.—N° 2484.

BECKTON, JAMES GEORGE.—"Improvements in heating
retort and other ovens for the distillation of shale, coal, and
other substances."

Retorts employed in distilling lias and other shale, or coal, in
order to manufacture petroleum, or other oils or gases, are con-
nected with blast or similar furnaces, in order to be heated by

their waste gases. Above a flue conveying the gases from the blast furnace, are arranged a series of oblong ovens, each one containing a number of retorts. These latter are suspended from their upper ends, leaving their lower ends unconfined, in two or more rows parallel with the flue, "so as to leave space between the " rows to act as a chamber for the combustion " of the gases.

According to one plan, the gases are introduced from the flue, and burnt in the oven without coming into direct contact with the substances being distilled. In the upper part of the flue, beneath the opposite ends of the oven, are two or more passages, terminating above as many grates, upon which fuel is burnt for the purpose of igniting the gases. The products of combustion are then conveyed through flues to the several ovens. "The " upper ends of the retorts are provided with removable covers " for charging in the materials, and are connected together by " lines of rail " so as to be filled from waggons. "The products " of distillation pass from the retorts " by means of internal perforated pipes, "and thence into a main." The remaining matters can be discharged from their lower ends into waggons running on rails beneath.

In a modification of this process, the heated gases produced in the oven are conducted directly into the retorts, "and come into " absolute contact with the matters for distillation," instead of acting externally and having their heat conveyed through the material of the retort.

[Printed, 2s. 6d. Drawings.]

A.D. 1864, October 11.—N° 2510.

WILKINS, FREDERICK.—"Improvements in apparatus for the " production of hydrocarbon vapours " from photogene, petroleum, or paraffine, benzole, benzine or naphtha, "and for the " application of the same to illuminating or heating purposes." An ordinary wet gas meter is supplied with hydrocarbon liquid instead of water alone, or in conjunction with "any other compound fluid." The drum is caused "to revolve by means of " weighted cords or spiral springs," in order to let the required quantity of gas or air flow through. To saturate the gas with vapour, revolving brushes dipping in the liquid are made to throw off sprays. These brushes are more especially used with a dry meter, in which case the hydrocarbon liquid must be placed in its

upper chamber. The proper working level of the liquid is maintained by connecting the outer case of the apparatus with a cistern by means of a small pipe regulated by a ball-cock; or the cistern, placed on the same level as the apparatus, has the liquid hydrocarbon it contains raised to the required level by pouring in water at intervals. In gasometers or air holders the hydrocarbon liquid is placed "in the inside only of the holder, water being on the outside."

[Printed, 10d. Drawing.]

A.D. 1864, October 17.—N° 2560.

CASSELL, JOHN.—(*A communication from Jean Best.*)—"Improvements in apparatus for the carburation of gas and atmospheric air." These are, "two superposed vessels, or a vessel divided by a horizontal partition. The upper vessel is intended to contain the volatile liquid, which is supplied, as hereafter described, to the lower vessel, in which it becomes vaporized. A tube, soldered or luted to the bottom of the upper vessel, extends to the level in the lower vessel at which it is desired to maintain the liquid therein; the upper vessel and the tube thus form a sort of inverted bottle, of which the tube forms the neck. The lower vessel is divided into partitions forming a labyrinth in order to cause the gas or air, which is to be carburetted, to traverse an extended surface." The outer partitions are, by preference, closer together than the inner, and they are soldered or luted to each other and to the body of the apparatus; they are connected both at top and bottom by metal cloth. These chambers are supplied with cotton wicks, sponge, or charcoal, &c. "At the bottom and, by preference, in the centre of the lower vessel there is a recess" for receiving "the water which is generally held in suspension in lighting gas on its exit from the meter," and which condenses in the apparatus; this recess is furnished with a tap. "The hydrocarbon liquid is introduced into the upper vessel by an orifice at top closed by a stopper," &c. "A float surmounted by a vertical rod is placed in the upper vessel to indicate approximately the quantity of liquid in that vessel. The float carries rings or lugs for to slide on vertical guides." "To prevent the liquid in the upper vessel passing down through the tube before referred to" when the supply orifice of the

upper vessel is open the upper end of the tube is closed by a stopper particularly constructed, and threaded so as to screw into the threaded sides of the orifice, and a second stopper or block is screwed on to the first stopper.

[Printed, 10d. Drawing.]

A.D. 1864, October 28.—N^o 2666.

LAIDLAW, DAVID, and ROBERTSON, JAMES.—“Improve-
“ments in exhausting, forcing, compressing, heating, cooling,
“and applying aeriform bodies, and in apparatus therefor.”
These are, in reference to this subject, in apparatus suitable for
exhausting illuminating gas; a cylinder is employed having its
ends closed, but with a horizontal shaft passing through them
and through its axis, “driven by a belt and pulley, or otherwise
“has fast on it an oval impellor or piston, the two diametrically
“opposite parts of which work in close but easy contact with
“the internal cylinder surface. A valve hinged to an opening in
“the top side of the cylinder is pressed down by a spring, so
“that its free edge follows and keeps constantly in contact with
“the oval impeller, and closing the opening which is in the outlet
“for the gas as each extremity of the impeller comes round.
“The inlet for the gas is made adjacently to the hinged side of
“the valve, and the impeller is made to rotate in such a direction
“that each extremity as it comes round passes the outlet first
“and then the inlet. The impeller may have three parts in con-
“tact with the cylinder, and instead of being oval, it may be of
“any suitable curved form.” A modification of this is also
described. In making a gas exhauster with a common recipro-
cating pump there is introduced “a regulator valve, which by
“throttling or partially checking the flow when the pump is
“at the middle of its stroke, moderates oscillation, and induces
“uniformity in the pressure. For such regulator valve to work
“well, there should be a reservoir or equivalent space between it
“and the pump.” Several modifications of this are described.
The application of the compressing apparatus, which resembles
ordinary steam hammers; several modifications are described.
In “compressing illuminating gas into portable or other vessels
“for convenience of storage or conveyance where ordinary gas
“holders or pipes are not available. For example, a gas lamp
“may be made in a portable form, with a receptacle for com-

"pressed gas in its base, provided with a valve opening inwards
"to admit the compressed gas, and with a suitable valve to
"regulate its supply to the burner or burners." A convenient
modification of the direct acting apparatus before described may
be used for exhausting gas or air, or for impelling it through
passages, an ordinary pump being substituted for the compress-
ing cylinder, and the parts being worked more slowly, or instead
of an ordinary pump, an inverted vessel may be attached to the
steam piston rod, and work in a water tube, like that of a gas
holder, whilst inlet and outlet pipes are provided for the gas or
air. With both these arrangements the regulator valve, referred
to above, may be used with advantage. Arrangements are
described "for impelling and at the same time heating air for
"drying and ventilating."

[Printed, 2s. 6d. Drawings.]

A.D. 1864, November 12.—N^o 2827.

ESPLIN, CHARLES.—(*Provisional protection only.*)—"Improve-
"ments in apparatus for regulating the supply of gas." These
are, to more readily regulate the flow of gas from the main.
"On the supply pipe coming from the main there is a diaphragm
"valve or cock; at the back of the cover of this diaphragm is
"applied the end of a small tube." The other end of such tube
may be in any desired position more or less distant. "In such
"more or less distant locality the other end of the small pipe is
"fixed to a vessel, which is divided by a diaphragm of larger
"diameter than that of the valve or cock before-mentioned.
"The small tube is to be full of air, or it may be other fluid.
"The regulation of the supply of gas is effected by causing the
"air or other fluid contained in the small tube to be pressed on
"by the regulating diaphragm, acted on by means of a screw or
"other instrument, by which the fluid will press on the diaphragm
"in the cock or valve on the supply pipe, and thus the passage
"for the gas from the main to the supply will be reduced in
"dimensions, and the flow of the gas will be lessened, the
"reverse action will follow the moving back of the regulating
"diaphragm, as the passage for the flow of gas through the cock
"or valve on the supply pipe will then be enlarged."

[Printed, 4d. No Drawings.]

A.D. 1864, November 14.—N° 2836.

HARLOW, ROBERT, and JOLLEY, WILLIAM.—“Improve-
“ ments in cocks and valves.” These are in arrangements “for
“ tightening the plugs without stuffing boxes or nuts and
“ washers, and for giving a large area of passage with a com-
“ paratively small diameter of plug.” In one arrangement the
barrel is placed in a casing, and it is held by a nut at one end,
and around the barrel, between the two ends, a cavity is formed
“ in the casing communicating with the opening or openings of
“ supply or discharge, which cavity is for the purpose of enabling
“ two or more thoroughfares to be made in the plug when there
“ is only one junction or when there are several.” “At one end
“ of the plug there is a shaped end for enabling it to be turned,
“ and through the plug a spindle is passed,” having one end
pointed or flat, and the other end screwed, the extreme end being
shaped for the purpose of turning it, and a nut employed for
keeping it tight. At one end of the barrel there is a bridge or
support for the pointed or flat end of the spindle to work upon,
so that when the spindle is turned in a screwed hole it shall draw
the plug to the barrel to any required tightness, and at the same
time enable the plug to be turned with much less friction than
with the present modes of tightening. Also, converting “that
“ description of equilibrium valve made with two pistons having
“ a number of V slits or other openings, and working in two
“ seatings into a reducing or diminishing valve by placing on
“ the spindle an additional piston working in a cylinder and con-
“ necting the top of the spindle to a weighted lever,” so that as
the weight is shifted the valve may be more or less closed and
diminished accordingly, which arrangement may be applied to all
equilibrium valves of a similar nature.

[Printed, 10d. Drawing.]

A.D. 1864, November 18.—N° 2883.

CROLL, ALEXANDER ANGUS. — “Improvements in the pre-
“ paration of materials to be used in the purification of gas for
“ illumination.” These are said to be “the employment of
“ chloride or sulphate of zinc, or chloride or sulphate of manga-
“ nese, or chloride of sulphate of iron and lime mixed with wood,
“ sawdust, or other suitable open porous matter,” as follows:—
When employing sulphate of zinc mixing it with lime, in pre-

ference quick or unslackened, in powder, and "in the proportion of five parts or thereabouts of the crystallized salt to one part or thereabouts of the lime." These matters are incorporated by spreading them in alternate layers and then, when the lime is slackened thoroughly, mixing them up with a free access of air." The composition obtained is mixed "with wood, sawdust, or other material adapted to hold it open and admit of the gas freely acting thereon." "When these purifying matters have become spent, so as to cease to remove sulphuretted hydrogen from the gas passed through them, they may be revived by free exposure of them to the atmosphere when they may be again applied to the purification of gas as before." "It will frequently be found that these purifying matters will by use lose their power of removing sulphide of ammonium," although they may still be capable of acting on carbonate of ammonia," in this case they are during the revivifying sprinkled over with a strong solution of the metallic salt used in their preparation or crystals of the metallic salt. "A like treatment will be found applicable to the sulphate or chloride of manganese, but with the latter salt only one half of the quantity of lime may be sufficient." In using chlorides of iron or zinc, taking solutions of the same containing about equal weights of anhydrous chlorides and water, adding thereto about one-fifth of their weight of the lime, and drying the mixture. The best results are obtained by passing the gas through the preparation with the sulphate of zinc or chloride of manganese and then through that of the sulphate of iron.

[Printed, 4d. No Drawings.]

A.D. 1864, November 24.—N° 2934.

SANG, FREDERICK.—(*Provisional protection only.*)—A "venting cupola chandelier."

Over each chimney of the burner is fixed a trumpet-mouthed tube, a series of which converge to a central vertical flue over the centre chimney, which also terminates in a bell mouth. Each of these tubes is surrounded by an outer casing for the admission of an upward current of cold air. These casings are united in one main tube surrounding the vertical hot-air tube from all the burners, and openings are made in it near the ceiling for the entrance of the outer current of air. Openings at the top of the outer and inner tubes close to the roof allow any heated air

outside the chandelier to pass into the flues. The vitiated air is conducted within the floor or roof to the chimney or other outlet.

[Printed, 4d. No Drawings.]

A.D. 1864, November 30.—N° 2984.

HENRY, MICHAEL.—(*A communication from Edmond Langlois*)—(*Provisional protection only.*)—"Improvements in means or "apparatus for indicating, signalling, registering, measuring, "and stopping escapes of gas." For this purpose the action or variation of pressure of the gas acts on certain working appliances, the pressure moving or keeping them in certain positions or states, and the reduction of pressure consequent on an escape works or acts on such appliances so as to cause them to work visible signals, sounding or acoustic signals, and valves or other appliances for stopping the flow of gas, also registering tracers and measuring instruments. Such appliances may be liquids moved by the pressure of the gas, as in a gauge or otherwise, or they may be moveable chambers, vessels, or diaphragms, telescopic or sliding cylinders, or other vessels, or floats or hollow plungers, or flexible discs, or vessels capable of expansion and contraction. They may be moved by weight caused to act by the effect of the pressure or variation of pressure of the gas. Jointed, revolving, or sliding plates, discs, or arms may be used as visible signals, and whistles, vibrating tongues actuated by air or other aeriform fluid; gongs, strings, spirals, or other surfaces struck or sounded by hammers, springs, or other agents, directly or by floats or peg wheels or trundles; also instruments worked by electricity may be used as audible or acoustic signals. A great number of arrangements for the application of the above means are described.

[Printed, 4d. No Drawings.]

A.D. 1864, December 3.—N° 3013.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from François Alphonse Jacquet.*)—(*Provisional protection only.*)—"Improvements in apparatus for heating and cooking by gas." These consist for heating "air in a row of gas jets and of a simple "jet set near the end of the row, of a space for storing up the "heat, and of a reflector which disperses and distributes the

"heat." "For cooking, the apparatus consists of a metal case ;
"it is provided with a ring burner with several jets, and above it
"stages of double discs which extend entirely across the case ;
"The double discs are formed with openings in the centre of the
"lower plate of the double disc, and with apertures near the
"edge of the upper plate through which the heated air passes,
"until it finds its exit through a perforated plate in the top of
"the case."

[Printed, 8d. Drawing.]

A.D. 1864, December 3.—N° 3018.

SIEMENS, CHARLES WILLIAM.—"Improvements in apparatus
"for the production, purification, and combustion of gases for
"heating purposes." These are, first, "constructing apparatus
"for converting carbonaceous matter," coal, peat, or wood into
combustible gases, in which such matter "is first caused to
"descend gradually through one or more vertical or inclined
"retorts, from the lower end of which it passes in a thick layer
"upon a fire-grate, the heated combustible gases resulting from
"the imperfect combustion of the fuel upon the latter being
"made to pass around or against the outer surface of the said
"retort or retorts."

Second, "constructing gas producers (which are chiefly appli-
"cable for the conversion of binding coal into combustible gas)"
so that "the fuel descends through an inverted funnel, acting
"more or less as a retort, upon a solid moderately inclined plane
"supporting the column of fuel, such inclined plane having one
"or more openings at the top for the admission of atmospheric
"air, as well as for the introduction of bars to break up the
"masses of coke, whilst one or more other openings are provided
"at bottom for the removal of clinkers and ashes, and for the
"introduction of a further quantity of air or steam, or both," in
order to complete the conversion of the carbonaceous matter into
gas. In place of the inclined plane above "a step grate" may be
employed, which admits air more freely amongst the mass of
fuel.

Third, "so arranging furnaces, ovens, or kilns in combination
"with one single regenerator or chamber filled with loosely piled
"fire-bricks, and regulating the admission of atmospheric air and
"combustible gases thereto, that at one time the combustion of
"air and gas can take place within the regenerator for the pur-

“ pose of heating the same, whilst at another time either the air
“ or the combustible gas alone passes through the regenerator that
“ has been thus heated and enters into combustion with the gas
“ or air on its entrance into the furnace, oven, or kiln; or atmo-
“ spheric air only is made to pass through the heated regenerator
“ in order to carry the heat thereof into the furnace, oven, or
“ kiln.” This is effected by means of passages from the re-
generator to the kiln above and by means of a reversible damper.
If it is only required to supply a moderate heat to the kiln for
the purpose of drying the goods the supply of combustible gas is
cut off (from the regenerator) by means of a valve or damper,
“ or the supply of air may be cut off by means of a damper,”
“ and the kiln warmed simply by the radiated heat from the
“ regenerator.”

Fourth, “ constructing apparatus for purifying gas from dust,”
by causing the gas containing the same to pass with velocity
through narrow passages “ into a chamber or reservoir in which
“ the motion of the gas is immediately checked and its direction
“ changed by being drawn into openings of other passages
“ situated at or near the top of the chamber.” This operation
may be furthered by steam jets, one opposite the mouth of each
of the narrow passages above mentioned. The steam jets besides
imparting “ velocity to the gas and dust passing through the
“ tubes ” moistens the dust and making it more heavy facilitates
its separation from the gas.

[Printed, 1s. 6d. Drawings.]

A.D. 1864, December 5.—N^o 3022.

TYE, RICHARD. — “ Improvements in sliding gasaliers, gas
“ pendants, and gas lamps.” These are first, “ for the purpose
“ of preventing the falling of the moving parts of the said
“ gasaliers,” the arrangements are such that “ when the slide is
“ pulled down the weights travel up the tubes or wires till they
“ reach the pulley frame. Should the chains break the weights
“ would immediately travel down the tubes or wires and rest
“ upon the pans or receivers at the bottom, the sliding part of
“ the gasalier would also fall, but the pans being a little larger
“ than the weights, the rings affixed to the water cup cannot pass
“ over them, so that the moving part of the gasaliers cannot fall
“ lower than the weight receivers.” In this arrangement “ the
“ wires or tubes do not interfere any more with the design of the

" gasalier than the pulley chain itself, as they both travel side by side and from one line."

Second, "a safety ball valve for sliding gasaliers and gas pendants;" the ball joint consists of two hollow parts "screwed together, the upper part being screwed to an ordinary socket at the ceiling of the room." In the interior of the lower part of the ball joint is a half ball (in the middle of which is a square shoulder) connected by a tail piece to the slide of the gasalier or pendant. "In the interior of the upper part of the ball joint is a bucket-shaped hollow plug" working gas-tight in the said part. In the side of the hollow plug is a hole communicating with its interior and a hole in one side of the interior of the ball joint. "From the bottom of the hollow plug a pin passes terminated by a square head." A perforated plate is supported on the head of the pin. The square shoulder on the half ball and the square head of the pin are connected by a square coiled spring.

Third, to enable glasses or globes to be readily raised, fixing upon the burner, in preference, a triangular piece of metal, at each end of which is a vertical rod or wire. On the inner side of the gallery are three projecting pieces or radial brackets through holes, in which the three vertical rods or wires on the burners slide.

[Printed, 8d. Drawing.]

A.D. 1864, December 6.—N^o 3030.

ATKINS, THOMAS.—(*Provisional protection only.*)—"Combining apparatus used for regulating, adjusting, and indicating the supply and flow of hydrocarbon and other gases and vapours with improved apparatus for effecting the perfect carburation and purification of such gases and vapors for illuminating and other purposes, and for improvements in the construction of the apparatus for effecting the same." The apparatus consists of a tank having a ring or rim in it, "and leaving a space between the inner rim and the tank filled with water, mercury, or other fluid forming a hydraulic joint, in which works a gas-holder inclosing gas or air to be carburetted." On the bottom of the gas-holder is an air chamber "to be used if desired" with "the usual guide rods and rollers applicable to gas-holders generally." The gas to be carburetted is passed through a regulating valve into the apparatus; after it is admitted it issues through a pipe or pipes into a bell-shaped space, and strikes

against the metal sides, by which it is driven down and passes up between these bell-shaped vessels called polarizers and distributing perforated domes which are fixed over the inlet conduits and polarizers, and covered with a capillary substance saturated with a carburetting liquid. The polarizing cones have arms or agitators on the bottom dipping into the liquid, by which it is kept stirred up. The gas or air escaping from the domes enters the body of the chamber enclosed by the gas-holder, passes through "a single purifying material for removing non-illuminating products from gas or air, or through a combination of such materials having the same object." "The liquid used to carburet the gas is either naphtha, naphthaline, benzol, carbolene," &c.; it "is stored in a separate vessel or vessels attached to and forming part or parcel of the vessel."

[Printed, *ad.* No Drawings.]

A.D. 1864, December 6.—N° 3039.

KEELING, JOHN.—"Improvements in apparatus for regulating the supply of gas." These are "in the mode of increasing or diminishing the weight used to counterpoise the gas-holder of an ordinary station governor," by "suspending to the opposite end of the balance beam to which the gas-holder is hung a hollow vessel instead of metal weights. This first vessel is placed in connection with another or second vessel of a similar size and construction, a communication between the two being made by a piece of flexible tube, one end of which is fastened to an orifice at the bottom of one vessel, and the other end is attached to an orifice formed at the bottom of the other vessel." This second vessel is suspended by means of a rope or chain which passes over a pulley and thence to a small windlass, to which a ratchet and click are appended. In the Provisional Specification it is counterpoised by a weight. "The two vessels are partially filled with water, and when it is deemed expedient to increase the pressure at the outlet of the governor, all that is necessary" is to lower the second vessel below the level of the first vessel, whereupon the water from the first will pass into the second vessel and "thus lighten the counterpoise to the gas-holder, which acting upon the conical governor valve beneath it, will open the passage for the gas and give an increased pressure." To diminish the pressure of the gas the operation is reversed. "In order to regulate the speed with

" which the charge from one pressure to another is effected," a valve is inserted internally at the bottom of the first vessel at the junction with the flexible tube, or it may be attached to the second vessel. It is stated that "a modification of the foregoing arrangement may be made applicable to governors which have no balance beam, by constructing the top of the gas-holder of such form and in such manner as shall permit of its containing water," or a separate vessel may be attached to the crown of the gas-holder.

[Printed, *ed.* Drawings.]

A.D. 1864, December 6.—N° 3042.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from William Elmer.*)—"Improvements in the manufacture of illuminating gas." These are, first, making "illuminating gas by distilling the gas stock in one retort, and converting the volatile product of the distillation into illuminating gas in another retort, in the presence of a material which when at a high temperature will absorb and fix the oxygen contained in the volatile product of the distillation."

Second, making "illuminating gas by distilling the gas stock in one retort, and converting the volatile product of the distillation into illuminating gas in another retort, in the presence of additional quantity of steam to that obtained from the gas stock, and of a material which will absorb and fix the oxygen contained in the volatile product of the distillation and in the additional steam." "Zinc has been described as the material for eliminating and fixing the oxygen of the vapour of water and other compounds of oxygen," but other materials may be used, as manganese and others.

"It is important that the operator should have the means of regulating the quantity of steam and of determining how much is required" in the retort. "The first of those two is furnished by the valves on the steam pipes, the second by the test burner and the glass portion of the discharge pipe of the gas-making retort, or by noting the accumulation of water in the hydraulic main or its escape therefrom. If the steam be admitted in too large quantities the illuminating power of the gas as shown at the test burner is impaired, and the steam valves are to be closed partially or wholly if necessary."

[Printed, *ed.* No Drawings.]

A.D. 1864, December 8.—N^o 3059.

MYERS, EDWARD.—“Improvements in wet gas meters.” These are “in the arrangement of the overflow and air tubes for maintaining the proper level of the water in the measuring drum of wet gas meters, and also to prevent the passage of unmeasured gas through the waste water chamber.” “For this purpose in place of employing separate tubes” for the above purpose, as was described in No. 1942, A.D. 1858, and No. 1592, A.D. 1863, combining the overflow and air passages in one tube which connects “the water reservoir and waste water chamber together, the stuffing boxes through which it passes into those chambers being formed with cap leathers for the tube to slide up and down through, in order to adjust the capacity of the meter and the level of the water therein. A wire is fixed or soldered on the tube and passes up through the meter to regulate the position of the overflow passage as desired. The air passage to the reservoir is formed by a division (by preference inclined) fixed in the tube, and an opening for the admission of air upwards is formed at the water level; just below this opening a lip or short branch is applied to form the opening for the overflow to the waste chamber. In place of having a division in the waste water chamber, the waste is conducted by a pipe or tube to the bottom of the waste water chamber, and when the waste water rises to a certain level it passes down a V-shaped overflow tube connected to the discharge orifice.” Shields are also employed to protect the inlet and outlet passages of wet gas meters to prevent any fraudulent tampering with the internal parts of the meters.” These shields “consist by preference of metallic plates or surfaces surrounding the inlet and outlet passages within the case of the meter.” “Suitable openings or perforations are formed in such shields for the passage of the gas.”

[Printed, 10*d*. Drawing.]

A.D. 1864, December 12.—N^o 3073.

RAMSBOTTOM, JOHN.—“Improvements in the manufacture of steel and iron, and in the apparatus employed therein.” These are, first, “the improved modes of heating high-pressure air to be used in the manufacture of steel or iron.”

Second, “the use of hydrogen gas or carburated hydrogen gas, or a mixture of both, along with atmospheric air, in the manu-

"*facture of steel and iron by the 'Beaumer process.'*" In the apparatus used in this process are "pipes for conveying the blast" or compressed air forward to the converting vessel," and it is now proposed to make the pipe of about twice the area, in order that it may afford room for a series of heated spheres which are supported on rails fixed in the pipe. "Each end of the pipe is closed with a lid, and the lower end, or that near the converting vessel is provided with a stop block to prevent the spheres injuring the lid." A modification of this is forcing the air through a vessel containing a number of heated spheres. Another mode is forcing the air between a series of heated tubes in a vessel.

In using gases along with the atmospheric air, about one part of carburetted hydrogen gas to thirty parts of air may be employed to eliminate sulphur and phosphorous from the converted metal, but the proportions may be varied.

[Printed, *1s.* Drawings.]

A.D. 1864, December 22.—N° 3180.

ARAM, JONATHAN GRUNDY.—"An improved mode of lighting "household and other fires," which consists in directly applying to the fuel lighted jets of gas supplied by means of a flexible hose or from a small main with jets. To quicken the operation a small fan may be used, in the mouth of the ejection tube of which is fixed a small tube. Outside of and concentric with this is a larger tube in communication with the gas pipe.

[Printed, *3d.* Drawing.]

1865.

A.D. 1865, January 2.—N° 5.

PARKER, JOHN FREDERICK, and TANNER, JOSEPH.—"Improvements in the manufacture of oxygen gas, and in treating and economizing the residual products of the said manufacture." These are, in reference to this subject, as follows:—Protoxide of calcium or quicklime is heated to redness with constant stirring and access of air, till all carbonic acid and moisture are expelled. Two parts, by weight, of this lime so prepared, are mixed with

one part by weight of nitrate of soda, both in powder, and exposed to a bright red heat in a close vessel or retort. The gas, consisting mainly of oxygen is "evolved into a condenser supplied with "water by which any nitrous acid formed is absorbed, and from "which condenser the oxygen gas thus purified passes to the "gas holder." The residuum in the retort is employed to obtain a second quantity of oxygen, as follows:—Two parts by weight, of the residuum are mixed with one part, by weight, of nitrate of soda, and this mixture is exposed "as before to a bright "red heat in a retort or close vessel, condensing the nitrous acid "by water, and passing the oxygen gas to the gas-holder, as "before described." "Instead of mixing the nitrate of soda "with twice its weight of lime, and using the residuum after "distillation in mixture with a further quantity of nitrate of soda "as described, the lime and nitrate of soda may be mixed in "equal proportions, in which case the residuum is not used a "second time."

[Printed, 4d. No Drawings.]

A.D. 1865, January 9.—N^o 67.

CALKIN, JOSEPH.—(*Provisional protection only.*)—"Improvements in taps."

This invention consists in employing in connection with the stem of the plug of the tap a catch or spring movement, so arranged as to admit of its taking into a corresponding notch in the barrel of the tap. Thus the plug when shut is held in a fixed position until released by the pressure of the thumb and finger while turning on the tap.

[Printed, 4d. No Drawings.]

A.D. 1865, January 11.—N^o 85.

GEDGE, WILLIAM EDWARD.—(*A communication from Jules Chartiez.*)—"An improved apparatus for cutting iron gas and "other pipes." The apparatus, somewhat of a square form, has a flat knife made to slide vertically in a groove made in the length and body of the screw-threaded cylinder knob or stock, through the top. This knife is governed in its vertical movement by a nut, which penetrates into a notch made in the side of the upper part of the knife. At the lower part of the apparatus is a moveable bearing, which may be set in motion by a recall screw, passing

through the bottom of the apparatus, to which is fixed a wrench "and may thus come and tighten up the sides" of the pipe which it is desired to cut. The bearing is guided in its movement by two tenons, which may slide in a groove made along the apparatus. The process of cutting pipes with this apparatus is as follows:—The pipe is introduced into the screw stock, then by means of the recall screw, which passes through the bottom, the moveable bearing is raised so as to press the pipe against the sides, the flat knife is then lowered by means of the nut, so that it penetrates the pipe, "then having fixed one of the ends of the pipe to be cut in a vice, one entire turn is given to the screw stock by means of the wrench levers" extending across the apparatus, and the pipe is cut. When the pipes to be cut have at their extremity an extra thickness, which prevents their entering the screw stock, by simply withdrawing two pins the lower part of the stock may be removed.

[Printed, 10d. Drawings.]

A.D. 1865, January 11.—N^o 86.

GEDGE, WILLIAM EDWARD.—(*A communication from Jules Chartiez.*)—"Improved pincers for gas and other pipes." This consists in making pincers which "may be worked with one hand" only, which is an incontestible advantage when working in "places of difficult or perilous access," as follows:—It is composed of a stem or rod serving for a handle, near the end of which is jointed a piece somewhat of the shape of a claw, of less thickness on the exterior than in the interior. The inner face of this claw carries notched or toothed segments of a circle or arcs of radii corresponding with the radii of the various running sizes of pipe. The notching of the arc serves to facilitate the grasping and holding of the pipes. The upper part of the handle is round, and it is also notched or toothed. The inner curve of the claw-shaped piece, with the notching of the arcs, are so calculated as to perfectly embrace and nip pipes of corresponding diameter on rotating the handle into such a position "that its axis passes nearly through the centre of the pipe." Another modification is that the inner face of the claw-shaped piece "is one single and same curved piece," and is notched or toothed, and at the end of the handle is a piece also notched, and it is between this latter, and the claw-shaped piece that the pipes are nipped.

[Printed, 1s. Drawings.]

A.D. 1865, January 17.—N° 142.

BEST, SEALEY JAMES, and HOLDEN, JAMES JOHN.—“Improvements in apparatus for charging and drawing gas retorts, and for other purposes. These are in substituting mechanism instead of manual labour for charging gas retorts, steam boiler, and other furnaces, charcoal ovens, and similar apparatuses with fuel, and withdrawing the coke and carbon therefrom. For this purpose there is fitted in front of a range of ordinary gas retorts an apparatus for feeding coal to as many scoops as there are retorts to be supplied, and consists of a number of troughs filled with coals from the coal heap, each being provided at their outer ends with toothed wheels gearing into one another, actuated by a lever and sector pinion, which tips over all the troughs into the charging scoops, and supplies them with the exact quantity of coals required. Other modes of tipping the troughs may be employed, such as fitting the ends of the troughs with pulleys and upsetting them by means of an endless chain, or a single scoop may be supplied with coals from a hopper by a rising and falling motion. The charging scoops are fitted to a travelling frame mounted upon wheels running upon trams, and turned by a locomotive engine and gearing. Beneath this frame is an endless band, running at right angles to the engine, by means of which the charging scoops when filled are fed into the retorts, where they are turned over by means of a rack and pinion movement on the frame to deposit the coals into the retort. The scoop shafts are each fitted with weights to counterbalance the weight of coals, and cause them to be self-reversing. The charging scoops are then drawn back by the endless chain and taken to be refilled.

The coke is withdrawn by a series of rakes hinged to the main frame, so that they can be tilted and raised or depressed. The heads of these rakes are brought to a vertical or horizontal position by a rod sliding under the rake shaft, and fitted with a screw which holds them in a horizontal position when the rakes are pushed in, but in a vertical position when they are withdrawn by the charging machine, thereby bringing the coke out with them.

Another part of the invention consists in mounting all the covers of a range of retorts in a rising or falling frame, each cover carrying sliding bars, which slide sideways in cross bars of the frame, so that one retort may be opened independent of the

others; or each retort cover may be connected together, by means of chains, from a bearing bar, and counterbalanced with weights, so as to open all the retorts for charging them with coal or withdrawing the coke, and be again lowered to close the whole of the retorts simultaneously.

[Printed, 4s. 6d. Drawings.]

A.D. 1865, January 18.—N^o 151.

GREGG, JOHN WILLIAM.—“Improvements in street and other lamps and lanterns.” These are, making the glass of the lamp or lantern of a shape tapering downwards, and the sides of bent glass so as to offer less resistance to the wind. The top or dome is of an “earthenware or china reflector, with or without a metallic covering, which is curved or otherwise shaped to suit the angle of reflection according to the position of the lamp. The reflector may or may not project or overhang beyond the circumference of the top of the lamp, and this part may be made of tin or other bright metal on the under side and painted white. When gas is used the tap or reflector may be situate near the centre of the lamp and of the usual construction, or “it may consist of two concentric tubes, one moving up or down inside the other and having a slot formed therein to serve as a guide; the gas is let in through the inner tube when it is drawn down, and is shut off by pushing up that tube until it is arrested by a stop.” At the bottom of the lamp or lantern there is fitted a trapdoor composed of metallic gauze. “The hot air escapes through suitable apertures at the top.” “The trap door which is weighted to cause it to close of itself, enables the lamp to be lighted by a small lamp on the end of a pole.” “The lamp may be supported on a ring or band suspended from the ceiling supported by a wall bracket, or attached to a pillar or other support.” “The whole is put together or taken asunder by three screws at each end of the ribs or sashes of the lantern.”

[Printed, 8d. Drawings.]

A.D. 1865, January 19.—N^o 165.

SHIPTON, JAMES ALFRED, and MITCHELL, ROBERT.—“Improvements in shaping and forging metals, and in the machinery and apparatus employed therein.” These are, “manufacturing

“ gas fittings known as ‘ tees,’ ‘ elbows,’ ‘ bends,’ and ‘ couplings,’
“ by machinery worked by steam, compressed air, or hand power,
“ such machinery being also applicable to shaping and forging
“ other metallic articles.” The machinery, when steam is employed,
“ consists of a sole or base plate having two horizontal
“ cylinders bolted thereon, with pistons having ‘ dies ’ of the
“ required shape fitted in the end of each, and which meet on
“ steam being applied at the back of each piston. At this point
“ there is a metallic ‘ block ’ or mould secured to the sole or base
“ plate, and over which a vertical cylinder is carried on a suitable
“ framework having a piston fitted with a ‘ mandrill ’ or ‘ die,’
“ the pistons of all these cylinders being actuated by steam
“ regulated by valves.” “ Another modification of this machinery
“ relates to placing cylinders at such angles, having pistons fitted
“ with ‘ mandrills ’ or ‘ dies ’ for the purposes of shaping, forging,
“ and finishing the aforesaid articles.” This is applied as follows :—A flat piece of iron of the required shape is laid “ on the
“ ‘ block ’ or ‘ mould ’ and a mandrill on same, and cause the
“ piston of the vertical cylinder to descend on the top of said
“ mandrill ” and admit steam at the back of the pistons, and “ by
“ repeated blows from these pistons containing dies (which can
“ be obtained by the admission and emission of steam in the cylinders),
“ shape such articles to the required form.” “ A second
“ modification relates to the forging, planishing, and finishing such
“ articles ” by placing them in mandrills contained in sliding
“ blocks brought together by levers and eccentrics or other similar
“ mechanical equivalents, and cause the pistons of these cylinders,
“ which contain ‘ dies ’ of the required form, to descend on such
“ articles, and forge, planish, and finish the same.”

[Printed, 10d. Drawing.]

A.D. 1865, January 26.—N^o 226.

CROLL, ALEXANDER ANGUS.—“ Improvements in the purification of coal gas.” These are said to be, “ the purification of
“ gas by the use of sulphuric acid, wood, sawdust, or other
“ suitable open porous substance, and sulphate of lime,” as follows :—The sulphuric acid, in preference, is “ highly concentrated ”
and also “ highly heated,” say, of sp. gr. about 1,700° and about
270° F., is combined with about its weight of dry wood, sawdust,
adding to two parts by weight of this combination 1 part by weight
of the sulphate of lime. “ These conditions may, however, vary.”

The gas to be purified is made to come first in contact with a portion of this mixture containing sulphate of lime, and then in contact with the acid and sawdust without the sulphate of lime, in separate purifiers, or otherwise. It is preferred "that the sawdust or other porous matter thus separately combined with sulphate of lime, be acidulated and saturated with ammonia by its previous use in the purification of gas."

[Printed, 4d. No Drawings.]

A.D. 1865, February 4.—N^o 311.

HILLS, FRANK CLARKE.—"Improvements in effecting the combustion of fuel in the furnaces of steam boilers and the fire-places of stoves, and of gas in gas burners, and in apparatus connected therewith." These are, in reference to this subject as follows:—effecting the combustion of gas by means of heated air by furnishing each burner with two chimney glasses placed one outside the other; what has been found "to answer well in practice is to allow space of about $\frac{3}{4}$ or $\frac{1}{16}$ of an inch between the two glasses, the inner one being three or four inches higher than the outside one. The outside glass should be fitted into or upon an air-tight gallery or support so as to prevent access of air to the burner except through the annular space between the two glasses, the inner glass being mounted on an open or perforated gallery or support at a higher level in order to allow the heated air which descends between the two glasses to pass under the lower rim of the inside glass and up to the burner. The openings in the gallery which supports the inside chimney glass are also to be limited so as not to allow more heated air to pass than is just sufficient to effect the perfect combustion of the gas." This principle is adapted to steam boilers and stoves, and particularly described and illustrated in its application to the same.

[Printed, 1s. 4d. Drawings.]

A.D. 1865, February 7.—N^o 342.

DE BRAY, ROMAIN.—"An improved reflecting apparatus for street and other lamps." This consists as follows:—"The reflectors, varying in number with the shape of the body of the lamp, are placed outside its glazed top;" these reflectors "may be larger or smaller, and more or less open, according to the

“ shape of lamp and the requirements of the spot to be lighted.
“ The reflectors are formed of two parts, the one parabolical and
“ the other flat or concave, that is to say, that the parabolical
“ part is soldered to or of one piece which covers the glass
“ wherever it is not covered by the parabolical reflector; this
“ plate also forms a flat or concave reflector according to the
“ shape of the glass upon which it is juxtaposed. The upper
“ glazed part or top of the lamp should be very much sloped to
“ give greater depth to the reflectors. Each reflector is furnished
“ with hinges so that it may be thrown back to be cleaned, and
“ for the cleaning of the glass which it covers. The effect of
“ the light thrown by these reflectors on the shadows produced
“ by the lateral ribs of the lamp is to destroy them; but to obtain
“ this result more surely, the reflectors may be placed so that their
“ outer centre comes above the lower ribs. Round lamps lend
“ themselves readily to this combination.”

[Printed, 6d. Drawing.]

A.D. 1865, February 7.—N^o 344.

SIM, WILLIAM.—“ An improved method of and improvements
“ in apparatus for extracting gases from mineral oils, and em-
“ ploying the same for illuminating purposes.” These are said
to be “the production of gas for illuminating purposes by the
“ rapid vaporization of mineral hydrocarbous oils;” “the pro-
“ cess of taking up the free carbon of the oils when converted
“ into a gas in the retort by the admission thereto of steam or
“ water;” “the arrangement of two retorts at different tempera-
“ tures for the purpose of generating gas from oils;” and the
“ production of gas for illuminating purposes from a mixture
“ of mineral oils, with peat or wood, either combined or sepa-
“ rately,” all substantially as follows:—The oil is in a vessel
above the retorts and is conveyed by a tube into one retort at a
temperature just sufficient to vaporize the oil. The vapor passes
into the second retort by means of a pipe; the second retort is
raised to a much higher heat to convert the hydrocarbon vapour
into permanent gas; the gas is conveyed by a pipe to the hydraulic
main, and thence to the washers and purifiers. Another modifica-
tion is, the oil is conveyed into one retort heated “sufficiently high
“ to convert the oil at once into permanent gas, the remaining
“ parts of the process being the same as in the preceding modi-
“ fication. When using oils containing a large excess of carbon,

" a proportion of water or steam is admitted into the retort at the hottest point when one only is used, but when two retorts are employed, the steam or water are admitted into the hottest retort " to be instantly decomposed, and thereby rendered capable of mixing with the excess of carbon." Instead of water, as above, " a portion of peat or wood, either combined or separately, dried to any required extent, may be distilled, and their illuminating gas mixed with the illuminating gas from the oils."

[Printed, 10d. Drawing.]

A.D. 1865, February 7.—N^o 350.

ROSSER, SAMUEL EGAN.—(*Provisional protection only.*)—" Improvements in the ventilation of pressing irons heated by gas, and for preventing the condensation of the vapour in the tubes or flues leading therefrom." These are, first, " drawing off the products of combustion (from the place or chamber in which the gas is burnt) by a pipe or passage, or series of pipes or passages," by means " of an air pump, pneumatic screw, bellows, rotary fan, or by other convenient or suitable means." Second, " preventing the condensation of the aqueous vapour contained in the products of combustion " passing off as above, by admitting thereto a suitable proportion of atmospheric air, whereby such aqueous vapour is retained in suspension and caused to pass away with the other products."

Third, heating the air admitted as above " causing it to pass through a series of passages surrounding the pipe or passage leading from the combustion chamber, the quantity of air admitted being capable of regulation by means of a cylinder surrounding the passages, and adjustable so as to close a greater or less number of holes whereby the air is admitted as required," and " its capacity for moisture is thereby increased."

[Printed, 4d. No Drawings.]

A.D. 1865, February 16.—N^o 447.

NEWTON, WILLIAM EDWARD,—(*A communication from George Hughes Sinclair Duffus.*)—" Improvements in apparatus for distilling petroleum and other volatile liquids, and for making gas." This consists of a retort the bottom plate of which rests upon a base, the outer edge of which takes the form of a gutter.

The central part of the still rises to a cone "or other shape, "reaching about two-thirds the height of the retort;" a wall of some suitable metal surrounds the upper part of the retort, leaving a flue space between it and the retort of "about six "inches in depth in a retort of the capacity of five hundred "gallons." There is an outer wall, between which and the last wall is a space "filled with any suitable non-conducting substance or composition," "1 part of plaster of Paris and 2 parts "of wood ashes by measure, mixed to a proper consistency in "water," has been used. Passing through them and the top of the retort is a pyrometer and a steam pipe connected with a perforated horizontal pipe, both passing nearly to the bottom of the retort, and in the centre of the top of the retort is the discharge pipe or neck. In making gas, &c. "from coal and carboniferous shale or other solid substances," the steam pipe is "so protected or combined with the walls of the retort as not to "be liable to injury from contact with the coal." There is a cock at the bottom for drawing off substances from the still. The furnace below the cone is to be supplied with gas or its equivalent through a gas pipe. The furnace is an annular hollow box whose top and bottom plates are perforated with holes which occur opposite to each other, and are connected by mineral or earthen tubes of a conical shape. The furnace is to be moveable so that the attendant can raise or lower it as required by a lever. There are air courses to admit air to the gas when burning.

[Printed, 10*l*. Drawing.]

A.D. 1865, February 24.—N^o 528.

NICHOLAS, JAMES.—(*Provisional protection only.*)—"Implements in converting coal oil into gas suitable for use as an "illuminator." These are, "by preference, by allowing a stream "of the oil to come in contact with a heated surface capable of "decomposing the oil into gas. The stream of oil is passed "into "a retort or other vessel heated to a full red heat. The gas "thus obtained is first conducted either through the ordinary "purifiers used in the purification of common coal gas, or into "a gasometer direct. The gas may be used by any of the modes "at present used in the consumption of ordinary coal gas as an "illuminator."

[Printed, 4*l*. No Drawings.]

A.D. 1865, February 27.—N° 547.

CHING, COMYN.—“An improved fluid valve.”

“The apparatus consists of three main portions, first, an iron cylindrical vessel, within which is formed a receptacle to contain quicksilver, and in opposite sides of which are situated two apertures, forming an inlet and an outlet for the passage through the apparatus of the gas or other fluid. The second portion of the apparatus is a plunger, also composed of iron, corresponding in shape to the interior of the cylindrical vessel, and to the receptacle for quicksilver contained therein, which plunger, by rising and falling within the cylinder, and dipping into or rising out of the quicksilver, thereby lets on or seals off the supply of gas or other similar fluid. The plunger has also formed within it a receptacle for quicksilver distinct and separate from that in the cylindrical vessel. This receptacle is situated in the longitudinal centre thereof, and its use is to seal off and render gas-tight the working parts surrounding the rod or wire by which the rising or falling actions are effected. The third portion of the apparatus is a cap that encloses the working parts and the two quicksilver receptacles above described.”

[Printed, *Ed.* Drawing.]

A.D. 1865, February 27.—N° 549.

SIM, WILLIAM.—“An improved method of extracting gases from mineral oil, and in employing the same for illuminating and heat-producing purposes, and in the machinery or apparatus connected therewith.” These are said to be, first, “the general arrangement and construction of apparatus for the utilization of the gases produced.” “The process of vaporizing mineral oils and burning them in the state of gas,” and the special arrangement and construction of retorts for vaporizing and gasifying mineral oils, substantially as follows:—“One kind of apparatus for producing the gas, consists of a vessel to hold the oil, from the bottom or sides of which a tube or tubes project, through which the oil is led by its gravitating power or otherwise, and in falling drops or is projected upon a heated plate of metal, earthenware, or other suitable material contained in an air-tight vessel or generator. Upon coming into contact with the plate it is vaporised, and the gas thus

“ formed is drawn upward into a gasholder, from which it is conveyed by pipes or ducts to places where it may be required to be burnt, as coal gas ordinarily is. Instead of vaporizing only a drop or drops of oil at a time, a quantity of it may be placed in a suitable vessel or holder and vaporized by heat from a suitable fire, after which it is to be led away to a gasholder, and thence to be burnt as described in reference to the former modification.” The gases from mineral oils, when applied for the purpose of generating steam in marine or other boilers, are conveyed from a gasholder or generator by a pipe or pipes to the ordinary or other fire-box. Within the fire-box there are placed several sets of burners, from which, as the flame escapes, it impinges against the usual heat-absorbent plates of the boiler.” The gas produced is also intended to be applied with or without a gasholder.

[Printed, 1s. 4d. Drawings.]

A.D. 1865, February 28.—N^o 568.

HALL, THOMAS SLOCOMBE.—“Improvements in gas-burners.” These are, first, in reference “to that class of gas burner known as the argand burner, or burners in which the gas issues from an annular aperture, leaving a central space for the passage of air to the flame to support combustion,” by causing a more perfect combustion of the gas. One mode of effecting this object is by adapting “to the central aperture of the burner an adjustable button or disc, which will have the effect of regulating the supply of air to the flame, and of deflecting it in such a manner as to cause a proper combustion of the gas. Air to the outside of the flame is made to pass up through a perforated metal plate on which rests the chimney or glass.” The adjustable disc or button is mounted on the upper end of a vertical rod or pin which is provided at its lower part with a toothed rack into which gears a pinion, whereby “the rod and disc may be raised or lowered as required.” Modifications of this arrangement are described.

Second. “Another form of burner, and which is particularly applicable for producing jets or pencils of flame for blow-pipe purposes, consists in making a circular aperture for the issue of the gas, and converting it into an annular aperture by the addition of a central tube through which a jet of air is forced into

" the centre of the flame in the same direction as the gas is issuing from the annular opening. The jet to form the pencil of flame from the ignited gas may either be given from the mouth of a workman through a suitable pipe, or it may be produced by mechanical means by a blowing apparatus."

[Printed, 8d. Drawing.]

A.D. 1865, March 3.—N° 596.

BOWDITCH, WILLIAM RENWICK.—" An improvement in carburetting gas, also in the preparation of hydrocarbons for carburetting gas, and improved methods of treating alkali which has been used to purify coal oils, shale oils, petroleum, and other mineral oils." These are, in reference to this subject, first, " carburetting gas for illuminating purposes by passing it over heated hydrocarbons," as follows:—"The vessel in which the hydrocarbons are heated is best made to form part of gasaliers and other gas burning apparatus." "This vessel has an inlet and one or more outlets for gas, the outlets being placed so that there is a free passage for gas when the vessel contains hydrocarbons." There is an aperture through which the carburetting vessel is supplied with hydrocarbons. This aperture is secured by a screw plug or otherwise. The carburetting vessel is heated by gas, hot water, or otherwise, so that the temperature of the contents is not raised more than 212° F. "When the carburetting vessel can not be incorporated in the gas burning apparatus it may be placed near the meter, or in any other convenient situation, but in such case the gas pipes must be fitted so as to avoid any depressions to (in ?) which condensed hydrocarbons might lodge and accumulate in the pipes."

Second. In preparing hydrocarbons for carburetting gas, it has been shown that these oils, "especially dead oil, obtained from gas tar, contain some portions which are too volatile and other portions which are not volatile enough to be used in an apparatus suitable for burning the bulk." The oils are put into a still and heated from 280° to 300° F. until no more oil comes off; the receiver is then changed, the temperature is raised very gradually, and the portion which distils between these temperatures is employed in the carburetting apparatus shown in No. 2937, A.D. 1862.

[Printed, 8d. Drawing.]

A.D. 1865, March 9.—N^o 663.

ANSELL, GEORGE FREDERICK.—“An improved mode of and
“ apparatus for ascertaining and indicating the presence of explo-
“ sive gases.” Applying the principle of the diffusing of gases
for indicating the presence of explosive gases. The manner of
carrying out this may be varied; thus, an india-rubber ball or
bladder may be inflated with common air and placed in a box
so as to support a lever jointed to the upper part of the box,
which, when forced up, sets an alarum apparatus free, and thus
an audible signal will be communicated of the presence of
danger. “This effect will be obtained when the inflated ball is
“ surrounded by an atmosphere of hydrogen gas, for the gas will,
“ on the endosmoses principle, enter and further expand the ball
“ or bladder, and thereby lift the lever and set the alarum in
“ action. A more rapid indication will be obtained by using an
“ inverted porous jar or vessel closed at bottom by a flexible cover
“ through which the end of a bent tube projects. In the bend
“ of the tube mercury is poured, and upon the open end of the
“ tube a plug of ivory is floated. The porous vessel being filled
“ with air will, if presented to an atmosphere of carburetted
“ hydrogen gas, absorb a portion thereof, which, by increasing
“ the pressure within the vessel, will cause a displacement of
“ mercury and raise the ivory plug” which may strike a bell, &c.
so as to cause an alarum. “Either of these arrangements, by
“ making metallic contact and thus closing a battery circuit, may,
“ through electro-magnetism, set an alarum in action at one or
“ more places where the danger signal is required to be given.”
For indicating the per-centage of carburetted hydrogen gas mixed
with the air, the following instruments may be used :—An inverted
syphon tube, one limb of which is graduated and the other is
expanded into a cup covered by a porous disc; the bend of the
tube is filled with mercury or other fluid. When this instrument
“ is presented to an atmosphere containing carburetted hydrogen,
“ it will indicate the per-centage of gas present by entering the
“ cup,” and cause the mercury to rise up the graduated limb of
the bent tube. For the use of mine inspectors the ordinary
aneroid barometer is modified, by inserting in the back thereof a
porous disc by the removal of the metal cap; the atmosphere of
the mine will enter the instrument and act upon the corrugated

chamber, and thereby indicate the presence of fire-damp. The apparatus above described are applicable to the detection and estimation of gas escaping from fissures in gas pipes in houses or other places.

[Printed, 10d. Drawing.]

A.D. 1865, March 9.—N° 669.

DELPÉRDANGE, VICTOR.—“An improved method of connecting together tubes or pipes used for conveying gas and water, and for other purposes” This consists as follows:—An oblong, oval, or other shaped long hole is formed in the main pipe, and that end of the circular branch pipe which is to be connected to the main pipe is spread or widened until it assumes a circular form somewhat similar to the aforesaid hole in the main pipe. “This end of the branch pipe has a screw cut about it, and carries a nut and loose metal washer, and resting upon this washer another washer of vulcanized india-rubber or other elastic material.” To connect the branch pipe thus fitted and formed to the main pipe, the end of the branch pipe is inserted into “the aforesaid long hole in the main pipe,” and the branch pipe is turned round one quarter of an entire turn, the nut is then tightened against the washer and hole in the main pipe. “By these means the enlarged end of the branch pipe, being crosswise of the narrow part of the hole in the main pipe, may be securely connected thereto and disconnected therefrom at will.”

[Printed, 8d. Drawing.]

A.D. 1865, March 13.—N° 704.

CLARK, WILLIAM.—(*A communication from Guillaume Pascal.*)—(*Provisional protection only.*)—“Improvements in apparatus for holding and regulating the position of lamp shades or reflectors.” These are, mounting the shades or reflectors of lamps or gas burners so as to reflect the light “on any suitable point.” This is done by means “of a zone or section of a sphere, which is made hollow or grooved on its exterior surface, being fixed to the chimney of the candle, lamp, or gas burner, on which it is applied; an oscillating ring is also mounted in axes at about the centre line of this zone to carry the reflector or shade, to which ring are fixed the parts for maintaining it in its relative position with the zone for producing the inclination

" of the reflector." There are representations of several reflectors arranged according to the above principle.

[Printed, 8d. Drawing.]

A.D. 1865, March 14.—N^o 717.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from Jonathan Griffen.*)—"Improvements in apparatus for vaporizing " hydrocarbon liquids for illuminating and heating." These are, first, in "distributing the atmospheric air under the surface of " the naptha."

Second, overcoming any "undesirable or unequal flow of gas."

The air receiver lying in the bottom of the generator has two rows of air holes at the sides and ends suitably formed and arranged to divide the air into numerous small streams, there is a perforated plate "with about sixteen holes to the square inch and " about the size of No. 18 wire gauze," placed "about midway " between the top and bottom nearly the full size of the generator. " with a rim entirely around its outer edge and resting upon " the bottom." There are two pipes for admitting the air, which pass through the top plate, also through the perforated plate and through the top plate of the air receiver, and are soldered to each plate. There are stay rods for holding the plates. Above the perforated plate is another plate which connects two upright perforated plates. Above this is a box, the bottom of which is filled with a perforated plate. This box is crowded with sponge. In the upper part of the box are two perforated plates, and above them is an outlet pipe for the gas.

[Printed, 1s. 4d. Drawings.]

A.D. 1865, March 21.—N^o 781.

PENNYCOOK, CHARLES HILL.—(*Provisional protection only.*)—"Improvements in constructing gasometers, tanks, casks, and " similar vessels." These are, "instead of attaching to each " other the metallic sheets or plates forming the shell by rivetting " the same continuously round their adjacent edges, such sheets " are connected together by narrow intervening seam strips " formed with grooves on each side, into which grooves the " edges of the sheets are entered. At the meeting corners, lapping " pieces are rivetted to the adjacent sheets to bind them to each " other, whilst the grooves are made tight by paint, cement, or

“ solder. At the bottom edge the frame ring may be formed
 “ with a groove to receive the bottom edges of the lowest line of
 “ sheets, whilst at the angle between the sides and the roof the
 “ frame ring may be formed with grooves in suitable positions
 “ for the side sheets below and the roof sheets above, or a narrow
 “ grooved seam strip may be used at the angle and a frame ring
 “ in addition.” “ In making gasometers and other tanks the
 “ same general construction may be adopted, and in place of the
 “ vertical seam strips, frame pillars will be required to give
 “ strength, such pillars being formed with grooves to receive the
 “ edges of the adjacent sheets or plates. A ring grooved on its
 “ under side and fitted upon the pillars and sheets at the top
 “ edge of the tank will bind the whole together. Casks and
 “ similar vessels may be rapidly and economically put together in
 “ a similar way. In some cases a single sheet will serve for the
 “ cylindrical part, and its two meeting edges will be entered into
 “ the grooves of a longitudinal seam strip, whilst its end edges
 “ will be entered into grooved rings.”

[Printed, 4d. No Drawings.]

A.D. 1865, March 22.—N° 809.

BAKER, WILLIAM MORRANT.—“ Improvements in Argand
 “ gas burners.” These are, “ applying a moveable valve or
 “ regulator to an argand gas burner below its upper surface
 “ when the gas is ignited, so that the supply of air through the
 “ argand burner to the interior of the flame may be regulated
 “ from time to time according to the quantity of gas which is
 “ allowed to pass to and is being burnt by the burner.” “ The
 “ form of the valve regulator and the manner of adjusting the
 “ same may be greatly varied,” but a valve or regulator is preferred
 “ which will admit of being moved by a screw, and be thereby
 “ held in the desired position for allowing the required quantity
 “ of air to pass through the gas burner.” A slide valve capable
 of receiving a lateral motion for regulating the quantity of air
 admitted to the under side of the burner can be used.

[Printed, 6d. Drawing.]

A.D. 1865, March 25.—N° 855.

CLARK, WILLIAM.—(*A communication from Auguste de Pey-
 roanny.*)—(*Provisional protection only.*)—“ Improvements in the

“ manufacture or preparation of materials for and in their application to lighting and heating purposes, also in apparatus used for the same.” These are, in the manufacture of portable gas to be conveyed and emptied into reservoirs ready for use. The gaseous products from mineral vegetable and animal matters are combined and condensed in a small volume by the aid of pressure. The poor gases are passed through a succession of cylinders communicating with each other by pipes and filled with fragments of charcoal. The charcoal absorbs the rich properties of the gas, leaving that portion which possesses but little lighting power. The gas is then eliminated from the charcoal by the action of heat, and is compressed by a powerful pump and forced into a series of cylinders containing mineral or essential oils; it then passes into a reservoir, where it is disengaged from the oil and flows into a gasometer in a highly enriched condition. The gas has then to be saturated with essential vapours, which is done by means of a carburetter in which the gas flows before passing to a second pump which forces it into worms or pipes and there deposits its essence. The gas thus manufactured is collected in reservoirs for withstanding pressure.

Before entering the pipes the gas is expanded by the aid of an apparatus for maintaining a constant pressure in the pipes; the gas enters this apparatus through a pipe closed by a cone valve, which it enters when there is too great pressure, and flows into an india-rubber bag enclosed by two metal plates acted on by a spring regulated by a screw in such manner that the cone valve cuts off the inlet of the gas only when the pressure has reached the necessary degree. Should it happen that the tension of the gas on passing the cone valve increases more than necessary, a certain proportion of air should be introduced into the gas by the employment of two drums similar to meters for measuring gas.

A new form of burner is also employed in which the gas after passing through a small orifice flows into a chamber, where it is expanded and issues from a second orifice ready for lighting.

[Printed, 6d. Drawing.]

A.D. 1865, March 28.—N° 876.

MOCQUARD, FRANÇOIS ADOLPHE.—“ Certain improvements in gas burners.” These are said to be, first, “ the application of a reservoir interposed between the burner holder and the

"burning apparatus, permitting the gas to be diluted before its egress."

Second, "the arrangements employed for regulating the current of air and increasing the surface of the flame," as follows:—

In manufacturing metallic or steatite gas burners with or without a chimney. When no chimney is used they are preferably made with steatite and the gas is caused "to dilate in a reservoir before it egresses by one or more slits or holes, after having passed through a certain space partly filled up with a plate or ball, causing the gas to circulate only on the sides of the burner. The ingress of air takes place near the flame by means of slits or holes made near where it egresses."

When a chimney is used "the tube of the gas burner where the dilatation takes place" is constructed "either with one reservoir or with as many reservoirs as there are rows of orifices, either of concentric slits or of holes on the external plate or focus set on the top of the tube." The air is caused "to enter through concentric conduits having holes or slits, and serving as a casing to each tube or separate reservoir. The ingress of the external air takes place and is regulated by means of a metallic casing which is concentric with the body of the burner, from which it is separated by a flange provided with holes or wire gauze."

[Printed, &c. Drawing.]

A.D. 1865, March 31.—N° 917.

BATHGATE, JAMES.—"Improvements in gas meters and in the machinery or apparatus connected therewith." These are, first, the cases of dry gas meters are made of one piece, and without a central division. The one diaphragm back made of sheet iron or other suitable material is substituted in place of two, and answers the purpose of a central division. "This back, on which are fixed the two diaphragms, is fixed by screws or holders projecting from the centre of the case. The chief advantage derived from this arrangement is that the two diaphragms can be taken out together."

Second. An arrangement by which the valves are "easily taken out, each valve being worked upon a separate plate, to which plates are also connected the inlets to the diaphragms and exit tubes. By removing the screws by which the small plates are

“ connected to the valve plates, these last-mentioned plates are removed. In the valve plates are two holes, namely, one from each of the exit tubes, over which is placed a box which contains the measured gas from these tubes; this box is attached to the valve plate of the meter by screws. On the inside of this box through which the measured gas passes are two vertical tubes of sufficient depth that in the event of condensation taking place they prevent the condensed gas from getting into or interfering with the action of the valves.”

Third. “ The use of a double flange on the top of the case by means of which the valve plate and top box connected to it are attached to the meter case. On the centre of the valve plate, and contained within the top box, there is fitted by screws, studs, or otherwise, a small plate containing the step crank, and crank support, tangent catch, and support for index spindle; the whole of these later parts may be removed by taking out the screws by which the plate containing them is fixed to the valve plate.”

[Printed, 10d. Drawing.]

A.D. 1865, April 4.—N^o 945.

WIGHAM, JOHN RICHARDSON.—“ Improvements in the means and apparatus employed for illuminating lighthouses.” These are, first, employing for the above purpose “ combustible gases produced from fixed or volatile oils, liquid hydrocarbons, or semi-liquid oleaginous compounds, and burnt without the aid of a wick,” instead of burning such oils with wick lamps as heretofore. These gases may be produced by means of the ordinary apparatus now employed for generating gas from such substances, but it is preferred to employ for that purpose apparatus described in No. 2795, A.D. 1861, “ which apparatus may beyond what is there described, be provided with a circular boiler for heating purposes.” Not any part of such apparatus is claimed as part of this invention.

Second, the use in lighthouses of burners for burning this or any other description of combustible gases, which will dispense with chimney glasses. The burner used, by preference, for such purpose consists of a number of jets, so arranged together in a cluster, and branching from a central supply pipe, that the requisite air for supporting combustion has ready access to each of the burners. Surrounding these burners, immediately below the level

of the same is placed a metallic cylinder, open at both ends, termed an equalizer, through which the air passes to the burners. Immediately above the top of the flames is placed "a copper or iron cylinder, with glass terminal (having their area proportioned to the number of burners employed)," which is termed "the oxydizer." "The apparatus is named the 'crocus burner.'"

[Printed, 8d. Drawing.]

A.D. 1865, April 5.—N^o 972.

ESPLIN, CHARLES.—"Improvements in apparatus for regulating the supply of gas." These are, in regulating the flow of gas from a gas main to a building, &c., "where several burners are employed on the same supply, and where such burners are more or less distant from each other, and from the supply pipe from the main," as follows:—"On the supply pipe coming from the main, there is a diaphragm valve or cock; at the back of the cover of this diaphragm is applied the end of a small tube; the other end of such tube may be in any desired position in the building or place, and more or less distant from the supply pipe." "In such more or less distant locality the other end of the small pipe is fixed to a vessel, which is divided by a diaphragm of larger diameter than that of the valve or cock before mentioned." "The small tube is to be full of air, or it may be other fluid." "The regulation of the supply of gas is effected by causing the air or other fluid contained in the small tube to be pressed on by the regulating diaphragm, acted on by means of a screw or other instrument, by which the fluid will press on the diaphragm in the cock or valve on the supply pipe, and thus the passage for the gas from the main to the supply pipe will be reduced in dimensions and the flow of gas will be lessened. The reverse action will follow the moving back of the regulating diaphragm, as the passage for the flow of gas through the cock or valve on the supply pipe will then be enlarged."

[Printed, 6d. Drawing.]

A.D. 1865, April 6.—N^o 980.

DAVIES, GEORGE.—(*A communication from Thomas Say Speakman.*)—"Improvements in the means of and apparatus for increasing the illuminating power of hydrocarbon oils and

"gasees." These are "consuming the carbon in and increasing the brilliancy of a flame produced by burning animal, vegetable, or mineral oils or fatty matter, or the flame of gas containing an excessive amount of carbon, by causing the said flame to decompose a supply of water conveyed to it by means of a wick or its equivalent," as follows:—The oil reservoir of the lamp is of any form and of any material, in its mouth is a metal cap, "to which is secured a tube of the usual form for receiving a flat wick. Above is another reservoir containing a supply of water, and from the bottom of this reservoir a tube projects upwards through the cap of the water reservoir" of proper dimensions for receiving the wick tube. On the cap of the water reservoir is a hollow projection, which is of an oblong form, and which surrounds those portions of the wick tube and exterior tube which project above the said cap, over this is placed the usual perforated dome, having the ordinary elongated opening. An annular strip of metal is connected to the cap of the water reservoir, by such legs or projections as will not interfere with the access of a plentiful supply of external air to the space about the dome, and to the interior of the chimney." Wicks being placed in both these tubes, and the one from the oil being lighted, "in a very short time the heat of the flame will decompose all or a portion of the water which rises to the upper end" of the other wick, "oxygen and hydrogen gases are evolved," and uniting "with the flame will consume the excess of carbon."

[Printed, 8d. Drawing.]

A.D. 1865, April 7.—N^o 997.

JACKSON, WILLIAM.—(*Provisional protection only.*)—"Improvements in the method of mixing gases and vapour, and in the machinery or apparatus connected therewith." These consist "of two apparatus, the one for producing a current of the aeriform fluid which is required to be charged with vapour, and the other for charging the aeriform fluid with the vapour. The first apparatus it is preferred to designate as the air machine, and the second the charger. The air machine consists of an outer case containing water or other liquid, in which revolves a drum having a hollow axis," divided into chambers. "These chambers have openings at one side for the entrance, and at the other side for the exit of aeriform fluid." The chambers and

openings "do not occupy all the width of the drum, but there is "a portion left vacant at the side, in which stands a tube passing "through the side of the drum at the axis, and the top of which "is above the level of the water, for the conveyance of the aeriform "fluid pressed out of the chambers." With atmospheric air this vacant space is only necessary at one side, but with any other aeriform fluid, "it is necessary to have a like space and tube on "the other side for the purpose of drawing in the gas to be "charged." "The charger is a case divided into two parts by a "division parallel to the top and bottom, into which division are "fixed tubes running down towards the bottom of the case. "These tubes are closed at the lower end, but holes are punctured "through the circumference." Each tube is enclosed in one or more tubular wicks, and "spiral wires having a diameter slightly "exceeding that of the outside of the tubes are inserted between "the tubes and the wicks surrounding the former, and within the "latter." If a more full saturation of the aeriform fluid is desired, the wicks surrounding each tube may be increased in number by again slipping over the first wick a spiral wire, and then another wick, and so on.

[Printed, 4d. No Drawings.]

A.D. 1865, April 13.—N° 1058.

COTTERILL, CHARLES FORSTER.—"Improvements in pipes "for conveying water and gas, and for other like purposes, and a "new or improved composition for joining the said pipes and "other similar pipes." These are, first, "in making the socket "of a conical figure, the narrow end of the cone being turned "outwards, that is, forming the open end of the socket. The "narrow or outer end of the socket is of slightly larger diameter "than the plain end of the pipe, so that the plain end of one pipe "can be inserted freely in the socket of the next. In joining "pipes made according to this mode, the lead or other material "with which the space between the end of one pipe and the "conical socket of other is filled, assumes the figure of a conical "ring, and any pressure within the pipes tends to wedge it more "tightly between the socket and end of the pipe." A small hole is made through the socket, through which the lead or other material with which the pipes are joined is poured.

Second. A composition is made by melting one part by weight of pitch, and incorporating therewith one and a half parts by

weight of sand. This composition is used by pouring it in a melted state through the hole in the socket. The proportions of pitch and sand given above answer very well, but the inventor does not limit himself to these proportions.

[Printed, 8d. Drawing.]

A.D. 1865, April 17.—N^o 1072.

NEWBIGGING, THOMAS, and HINDLE, ALEXANDER.—“Improvements in wet gas meters.” These are as follows:—Wet gas meters as hitherto constructed have the defect “if subjected to an excess of gas pressure (as is sometimes the case) the water will be driven from them through the index boxes, the ‘head’ of water in the tube which encloses the shaft giving motion to the registering mechanism having been hitherto relied upon alone to resist the gas pressure, and consequently the index box or case has been hitherto left open to the atmosphere, being merely used as a cover to protect the mechanism from damage or from being tampered with.” To remove this defect above referred to making the box or case enclosing the index or registering mechanism tight against the atmosphere, so as to prevent the air enclosed in it from escaping, which will thus resist the gas pressure, and will prevent the water in the meter from rising up the tube which encloses the shafts giving motion to the registering mechanism.” In preference, the box or case is made “of cast iron, with one side glazed, so that the index made be read through it, and secure it to the upper part of the meter case by screws, making the joint between the two air-tight by putty or other suitable cement, or the box or case may be made of tin plate or any other suitable material and soldered to the meter case, or the box or case may be made so as to be closed upon all sides and screwed upon the upper end of the tube ascending from the meter and surrounding the shaft, giving motion to the registering mechanism.”

[Printed, 1s. 2d. Drawings.]

A.D. 1865, April 20.—N^o 1109.

WISE, FRANCIS.—(*A communication from Charles Massey Cresson.*)—“Improvements in gas regulators and valves for the same.” These are, first, in the use in gas regulators, of a “holder of the tapering form,” so that as the “holder falls the

" pressure of gas in the outlet pipe shall be increased to compensate for the increased friction of a large amount of gas demanded for a large number of burners in extended gas fittings." In carrying out this, within a cylindrical casing is a smaller one, and between the two is an annular space for containing " water, glycerine, or other suitable fluid." The inner cylinder is closed at the top, except at an opening near the center for receiving the valve described under the second part of this invention, and another opening communicating with an outlet pipe which passes through the bottom of the casing, there being an opening in the latter communicating with the inlet pipe; the gas holder which is made in the form of a hollow frustum of a cone closed at the top, is contained in the annular space between the two casings, the lower edge of the holder being secured to an annular float adapted to, but arranged to move freely in the said annular space. " The accurate vertical movement of the holder within the exterior casing is insured by three guide rollers, each of which turns in a bracket attached to the upper end of the holder, and bears against the interior of the casing."

Second, " a valve having a stem or tail, in which are formed two or more excavations or depressions of different lengths," and arranged so that in removing the valve from its seat the longest excavation may form the communication for the passage of the fluid prior to the fluid escaping along the shorter excavation. This valve " will thus present for the escape of the gas openings increasing in number and area as it (the valve) is removed from the seat."

[Printed, 1s. Drawings.]

A.D. 1865, May 2.—N^o 1226.

RUSSELL, THOMAS. — (*Provisional protection only.*)—" Improvements in valves for liquids, steam, and gases." These are, the means " whereby the valve is raised from and lowered on to its seat" by " a hand wheel or collar working on the body of the valve, the axis about which the said hand wheel or collar rotates being coincident with the axis of the valve."

" At opposite sides of the valve chamber are parallel slots extending nearly from end of the said chamber. To the top of the valve a cross bar is fixed, the ends of the said cross bar passing through the said slots. Upon the valve chamber the hand wheel or collar works, the valve chamber passing through

" a hole in the centre boss of the hand wheel or collar." The hand wheel or collar is held in its place on the chamber " by two collars, one fixed on the top of the chamber and the other screwed on the lower end of the chamber; the central boss of the hand wheel or collar is ground so as to work tight between those two collars. In the opening in the boss of the hand wheel or collar a concave screw is cut, and on the ends of the cross bar which project through the slots in the valve chamber a convex screw is cut, which convex screw takes into the concave screw in the hand wheel or collar. By turning the hand wheel or collar in one or other direction the action of the screw head in its boss on the screw at the ends of the cross bar causes the said cross bar to raise or fall and to open or close the valve. When a collar is used in place of a hand wheel the said collar may be turned either by a fixed arm or lever or by a spanner."

[Printed, 4d. No Drawings.]

A.D. 1865, May 6.—N° 1266.

SWINDELLS, ISRAEL.—(*Provisional protection only.*)—" Improvements in the manufacture of coal gas." These are, " during the distillation of coal or cannel in the manufacture of gas," admitting or passing " steam at high temperatures " into the retorts amongst the ' charge;' by so doing the bisulphide of carbon liberated during the distillatory process is decomposed and carried forward by the gas to the purifiers in a form or condition for which the ordinary purifying agents have great affinity." This is effected by laying " perforated pipes along the bottom inside each retort," and connecting such pipes with others leading from superheating apparatus in which the temperature of the steam is raised. When a ' charge ' of coal or cannel is ' thrown in,' a small quantity of steam is admitted through the pipes and by the perforations amongst the ' charge,' but when heat has reached the mass, then a larger quantity is allowed to enter, the admission being controlled by valves or taps or other suitable apparatus."

[Printed, 4d. No Drawings.]

A.D. 1865, May 8.—N° 1269.

FONTAINEMOREAU, PETER ARMAND le Comte de. — (*A communication from Louis Joseph Asselin de Monnerville.*)—(*Provisional protection only.*)—" Certain improvements in apparatus

" for illuminating." These are, "preventing the shadow produced by a light from being projected around the said light," by placing above the flame "a cap supported by very thin rods, and holding a reflector, the surface of which is so traced that the luminous rays after reflection are made to converge lower than the luminous burner, and to produce light underneath the said burner, which is in the shade in the apparatus now in use." This apparatus "is applicable to all kinds of lamps, as well as to the burners of gas lamps employed in streets, and to all other kinds of gas burners, whatever may be their construction."

[Printed, 4d. No Drawings.]

A.D. 1865, May 9.—N° 1287.

JACKSON, WILLIAM.—"An improved method of mixing gases and vapour, and in the machinery or apparatus connected therewith." This consists of apparatus, the first part of which it is preferred to designate as the air machine, and the second the charger. The air machine consists of an outer case containing water or other liquid in which revolves a drum having a hollow axis." The drum is divided into chambers having openings at one side for the entrance, and at the other side for the exit of the aeriform fluid. The openings are formed by the sides of the chambers being placed so as to overlap the sides of the adjoining chamber, so that when the inlet of any given chamber is submerged to a required depth, the exit shall begin to rise out of the water. The chambers and slits do not occupy all the width of the drum, but there is a portion left vacant at the side, in which stands a tube passing through the sides of the drum at the axis, and the top of which is above the level of the water, for the conveyance of the aeriform fluid pressed out of the chambers. In cases where it is required to charge atmospheric air this vacant space is only necessary at one side, but in cases where any other aeriform fluid is to be charged, a like space and tube may be used on the other side for the purpose of drawing the gas to be charged. "The charger is a case divided into two parts by a division parallel to the top of the case, into which division are fixed tubes arranged in a vertical position." These tubes may be open or closed at the lower end, and have holes punctured through the circumference. Each tube is enclosed in one or more tubular wicks and spiral wires or other suitable distending apparatus

having a diameter slightly exceeding that of the outside of the tubes are inserted between the tubes and the wicks surrounding the former, and within the latter. If it is required to more fully saturate the aeriform fluid with the liquid, the wicks surrounding each tube may be increased.

[Printed, 10d. Drawing.]

A.D. 1865, May 10,—N° 1296.

MYERS, EDWARD.—(*Provisional protection only.*)—"Improve-
ments in wet gas meters." These are, first, to prevent any
fraudulent abstraction of unmeasured gas. "The inlet pipe or
passage conducts the gas into an internal chamber or passage
formed in the upper part of the waste water chamber, and this
internal chamber is in communication with and conducts the
gas to the measuring drum. A pipe descends from the internal
chamber to considerably below the water line in the waste
water chamber, such pipe serving to carry off any condensed
water from the inlet passage. A bent pipe is applied to the
overflow orifice which is at the upper part of the waste water
chamber; the lower end of this bent pipe is surrounded by
another pipe or cylinder closed at the bottom, but open at the
top to permit the waste water to flow into it and up the over-
flow pipe."

Second, these improvements are applicable to wet gas meters, such
as are described in No. 1942, A.D. 1858, No. 1592, A.D. 1863, and
No. 3059, A.D. 1864, and to other meters of a similar character.
"In the arrangement of compensating apparatus employed for
adjusting and maintaining the proper level of the water,"
described in these Specifications, "no provision was made to
prevent the frequent unsealing of the air tube caused by the
agitation of the water line during the revolution of the drum,
as each quarter or division thereof descends." To obviate this
defect two openings are formed "between the measuring drum
and air tube or fountain chamber, one orifice being compara-
tively small near the bottom of the chamber below the water
line communicating with the water in the measuring drum, an
opening or orifice being formed between the drum and the
reservoir or water supply chamber." Another opening is in the
upper part of the air tube above the water line for the escape of
measured gas to the outlet pipe.

[Printed, 4d. No Drawings.]

A.D. 1865, May 13.—N° 1334.

CLARK, WILLIAM.—(*A communication from William Resor.*)—(*Provisional protection only.*)—"Improvements in gas burners and "chimneys." These improvements, it is stated, have for their object the regulation and production of "a suitable draught in "the chimneys of gas burners, with a view to obtain the complete combustion of the gas, and also obtain considerable "economy in its rate of consumption." An ordinary Argand burner has a chimney of glass or other material for enclosing the flame and producing a draught, there are clips for holding the chimney, and also for supporting a cap perforated with holes for the admission of air to the burner, on the top of the chimney is a metal or other disc or cover having a hole in its centre. This disc may have a greater or less number of holes according to the draught necessary for ensuring perfect combustion; "instead of "being surmounted with a disc as described, the chimney may "be contracted at the upper part."

[Printed, 8d. Drawing.]

A.D. 1865, May 18.—N° 1370.

WILLIAMS, WILLIAM RICHARD.—"Improvements in dry gas "meters." A cylinder or drum is provided with apertures for the inlet and outlet of the gas; these apertures are connected together by a flexible tube of soft leather, preferably goat skin, or india rubber, &c. In the centre of the cylinder or drum, and parallel with the sides thereof, is a shaft or spindle working in bearings of glass, metal, &c., fixed in the ends, or any other convenient part of the cylinder or drum. "This shaft has on it a "number of radial arms or other like means for supporting pins "or studs, and on each of these pins or studs is a roller, arranged "so as to turn freely and run upon the exterior surface of the "flexible tube, thus closing the said tube and cutting off the "communication between the inlet and outlet apertures. The "pins or studs carrying the rollers are adjustable, and the rollers "are kept in contact with the surface of the flexible tube by "springs," &c. On one end of the shaft or spindle "is fixed "a pinion working into another pinion connected to the index, "and by varying the size of these pinions the registering capacity "of the meter is regulated. To keep up a continuous flow of "gas through the meter it will be necessary to employ two or

“ more of the flexible tubes and sets of rollers working thereon,
“ and instead of a single large flexible tube a number of small
“ tubes may be used for each set of rollers to act upon. When
“ the gas enters through the inlet aperture the pressure inflates
“ the flexible tube, and causes it to press against and force
“ forward in the direction of the outlet aperture the roller then
“ in contact with the said tube. The portion of the tube immediately behind the roller is thus filled with gas. As this
“ roller passes off the flexible tube at the outlet end, another
“ roller arranged at the required distance behind the first one
“ comes on to the said tube at the inlet end, closing the tube, and
“ cutting off the communication with the inlet aperture, while
“ the gas contained in the flexible tube between the two rollers
“ flows out at the outlet aperture.”

“ The tube is again filled with gas, and again emptied behind
“ the second roller, the operation being repeated according to
“ the length of the flexible tube and the number of rollers acting
“ thereon. The shaft or spindle in the centre of the cylinder or
“ drum being caused to revolve by the action of the flexible tube
“ upon the roller, and this shaft being connected with the index,
“ the quantity of gas passing through the meter is measured and
“ accurately recorded.”

[Printed, 1s. 8d. Drawings.]

A.D. 1865, May 19.—N^o 1381.

BROOKES, GEORGE HENRY.—“ Improvements in sliding gas
“ pendants or chandeliers.” These are, constructing “ sliding
“ gas pendants or chandeliers ” so as “ to reduce the noise and
“ shock now felt and heard in ordinary pendants or chandeliers,”
as follows:—First, springs are placed “ at the bottom of the
“ outer or sliding tube, or at the top of the same, to act as a
“ buffer or repelling agent when the opposing parts are meeting.
“ The said springs, wherever they are placed, are to be for the
“ reducing the shock and noise caused by the opposing parts
“ meeting.”

Second, using “ in the place of springs some repelling agent,
“ such as vulcanized india-rubber, to act for the same purpose,”
and also placing “ over or around the wheels or pulleys to check
“ or deaden the sound of the chains or other material passing
“ over them, vulcanized india-rubber or some such elastic sub-

"stance;" also around the inner tube placing "a piece of some elastic substance to reduce the friction and noise."

Third, making "the wheels or pulleys of a noiseless character when in motion in lieu of brass as now used," and, in preference, making them "of vulcanized india-rubber or some similar substance."

[Printed, 8d. Drawing.]

A.D. 1865, May 19.—N° 1386.

DAVEY, WILLIAM.—"Improvements in apparatus for washing or purifying coal gas, and for producing ammoniacal water therefrom." These are, first, "constructing apparatus for freeing coal gas from ammonia and bisulphide of carbon, consisting of a closed vessel having a central chamber, the lower open end of which dips slightly beneath the level of the water or other fluid contained in the vessel, and from which immersed edge of the chamber a grating, or perforated or gauze diaphragm, also slightly immersed beneath the level of the fluid, is made to extend to the sides of the vessel, so that the gas being made to pass into the central chamber depresses the fluid so as to pass under its lower edge and beneath the grating or diaphragm, whence it rises through the openings or perforations thereof, and through the shallow stratum of water over the grating into the space surrounding the central chamber." Gas tar or other fluid may be used in place of water to free the gas from bisulphide of carbon.

Second, "placing upon the aforesaid grating, or perforated or gauze diaphragm, a layer of pebbles or other suitable granular substance, in order the more effectually to bring the bubbles of gas into intimate contact with the fluid."

Third, "constructing the central chamber with its lower end immersed some depth into the fluid, and widened out, and forming in such immersed portion perforations or small openings in such manner that the gas in depressing the fluid inside the chamber uncovers such perforations or openings so as to escape through them."

Fourth, "the employment of a series of two or more such before described apparatus acting in combination with each other and with the system of pipes and valves."

[Printed, 10d. Drawing.]

A.D. 1865, May 20.—N° 1395.

SMITH, WILLIAM, and SMITH, GEORGE BROWNE.—“Improvements in wet gas meters.” These are, first, in the method of constructing the supply cistern, &c., “to that kind of gas meter called compensating, and on the bird-fountain plan.” “The cistern or reservoir is placed above the square frame of the meter, the top of which forms the bottom of the reservoir.” In this reservoir is a cup which serves the double purpose of containing the float and allowing the water to descend from the reservoir when required by a small hole in the centre, which also admits of the float wire passing through. On the end of this wire “is a loop or eye for receiving a bar acting on a lever, which is also connected to the rod of the inlet valve by a similar eye at the bottom. The inlet pipe through which the valve rod passes is formed with a junction or bend for the purpose of conveying the gas first into the waste box, and from thence through the bent pipe leading direct to the wheel, and so long as the cup of the reservoir is charged with water, the float will keep the lever bar suspended, and the valve cannot fall.”

Second, “instead of a sound reservoir on the bird-fountain plan as before,” employing “an open reservoir which, when filled, the water will flow down the spindle pipe, fill the body of the meter, and raise the float. In the bottom of the reservoir is a small tube descending down to the lever bar, on which is placed a stud or buffer acting as a valve, so that when the meter is properly charged, the lever bar will be up and close the bottom of the small tube by the stud coming in contact with it; but as the float is affected by a diminution of water, the float and lever bar fall, the stud leaves the mouth of the pipe, and the water falls from the reservoir until the mouth of the pipe is again closed.”

Third, constructing “compensating meters without reservoirs. This is attained by having the water supplied to the meter in a similar manner to that in which it is supplied to an ordinary cistern. The float carries a second lever bar. Above or below the fulcrum a valve is attached, and when the float rises to its proper height closes the tube which admits water to the meter, and so holds it in check until a fresh supply is required.” Sometimes the connection is formed “between valve and float in compensating or non-compensating meters by means of a tilted

" or balanced rod having the valve rod united on one, and the " float rod on the other side of its fulcrum." The valve is fitted to the top or bottom of the reservoir.

Fourth, in fitting to gas meters an inclined chamber with an aperture at its extremity, and through which the gas is free to pass; a ball is placed in the chamber, and it remains at the back or inclined portion thereof so long as the meter is kept in a vertical position, but as soon as the meter is tilted the ball runs along the chamber, and closing the aperture at the end thereof so shuts off the passage of gas. By this means gas is prevented " from passing through a meter unless it is in proper " position, and consequently gas cannot pass without being " measured."

[Printed, 10d. Drawing.]

A.D. 1865, May 25.—N^o 1424.

COFFEY, JOHN AMBROSE.—(*Provisional protection only*).—

" Improvements in the retorts used in the manufacture of gas " and in other distillations, which improvements are adaptable " to evaporating vessels." These are, " a case in which an " archimedian screw is fitted, the same having an handle (or " portion to which driving gear may be connected to its axis), " which axis shall project beyond the case aforesaid, and by the " rotation of this axis the screw will be kept in motion and will " continually agitate the material under process of distillation." It is " provided with a hopper and a discharge door or opening," so that " the operation may be carried on continuously without " 'drawing' the retort." In some instances the case of the retort might be made to rotate and the screw made stationary; or instead of a screw a series of arms, vanes, or agitators, might be adopted. In adapting these improvements to evaporating vessels the top of the case should be made open, or if need be, a duct is made " leading from the upper part of the vessel to a worm or " condenser or cooler."

[Printed, 4d. No Drawings.]

A.D. 1865, May 25.—N^o 1437.

BRAY, GEORGE.—" An improved gas burner." This consists as follows:—" A gas burner in which two or more jets or sheets " of flame are caused to impinge upon each other and thus form

"one flame;" this is effected by the use of double-headed burners, or burners so made as to emit two jets or sheets of flame, by preference, at an angle of 30° to each other, and also near enough to each other to allow the respective jets or sheets of flame to impinge upon and mingle with each other. More than two jets of flame may be used if desired, similarly placed to each other, but two is believed "to be most generally useful." The class of jet or sheet preferred is "that produced by what is technically used as the 'bat wing' burner, though of course others are applicable."

[Printed, 4d. No Drawings.]

A.D. 1865, May 27.—N^o 1458.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Jean Theodore Scholte.*)—"Improvements in apparatus for measuring gas and other fluids." These are, "in constructing liquid gas and fluid meters with an internal drum carrying a central perforated tube, and spiral vanes extending from the tube to the inner edge of the drum. The drum is free to revolve upon a shaft extending at back beyond the drum, and carrying a worm which gears into and works a worm wheel on the shaft of an ordinary gas counting or registering apparatus. Space is left all round between the outer casing and the drum. The gas inlet pipe is carried through the front of the drum and is bent upwards; a valve is placed over the top of the inlet pipe and communicates by a cross head with two floats, the gas outlet pipe is placed in the upper part of the casing; there is an inlet pipe for the admission of water into the apparatus and an overflow pipe for running off the water, should it rise beyond the proper level." "The meter can only act when the water is at a certain fixed level, and the level is such that the floats keep the valves raised from the gas inlet pipes; should the level be below its fixed point, the floats fall, bring down the valve, and close the inlet of gas."

[Printed, 6d. Drawing.]

A.D. 1865, May 31.—N^o 1494.

MONIER, HYPOLITE.—"An improved burner for gas and other lighting apparatus." This consists, first, in making "the burner in such manner that openings or draught holes may

“ be formed by means of two or several pieces of glass or other
“ suitable transparent material, fitted together face to face,
“ having formed throughout their length or width openings or
“ concavities varying according to requirements. Thus, when
“ two plates or pieces of glass are brought together face to face
“ the openings or concavities in one plate will come opposite
“ those in the other plate, thereby forming a series of draught
“ holes, or one plate only may have concavities, the other being
“ plain, as may be desirable.” This improvement, it is said, is
applicable not only to the new gas burner, but also “ to other gas
“ burners for dividing the air into a number of small streams,
“ and also to all kinds of burners for oil lamps.”

Second, “ the use of a metallic alloy, which although fusible,
“ can be employed ” in this gas burner, “ because the heat pro-
“ duced is never high enough to melt the said alloy, in conse-
“ quence of the new arrangements and of the treble draught
“ system introduced therein.” The alloy above referred to is
composed “ of 57 parts of tin, 38 of lead, and 5 of regulus, for
“ every 100 parts,” but “ these proportions may be varied to a
“ small extent.”

Third, “ the new burners are composed, 1, for the metallic
“ parts ” of the above alloy ; “ 2, for the tubes and burners of
“ plastic porcelain, earthenware, and any refractory clay ; 3, for
“ the draughting system of glass and any vitrifiable and trans-
“ parent materials,” so arranged as to serve as substitutes “ for
“ basket gallery, cone, and other metallic parts used in other
“ systems.”

[Printed, 10d. Drawing.]

A.D. 1865, June 1.—N^o 1507.

CLARK, WILLIAM. — (*A communication from Henri Auguste Georges du Vergier Marquis de la Rochejaquelein.*)—“ Improve-
“ ments in the means of carburetting or treating aeriform fluids
“ for lighting and heating purposes, and in apparatus for the
“ same.” These are, first, “ employing and constructing appa-
“ ratus of any form composed of superposed reservoirs contain-
“ ing a certain quantity of light inflammable essence (such as
“ American petroleum, benzine, or other hydrocarburets) which
“ reservoirs are connected together by tubes serving for the pas-
“ sage of the ambient air to be transformed into gas for light-

“ing and heating purposes.” “The upper reservoir is furnished with an air inlet aperture,” whilst the lower one has an exit aperture for the gas; each chamber is provided with an emptying cock and aperture for examining the condition of the spongy or porous matters or the level of the liquid. “The upper part of the generator is furnished with nozzles having screw caps, so as to permit of the introduction of a fresh quantity of carburetting liquid when the whole has become volatilized.”

Second, “placing the reservoirs in communication with a supply chamber having a constant flow, as also of disposing one or more diaphragms of wire gauze in the tubes above mentioned for the purpose of intercepting the passage of the flame.”

Third, transforming without any mechanical means atmospheric air into gas by the passage of air as above “without the aid of any apparatus for inducing artificially the entrance of the atmospheric air and the escape of the gases, which are thus naturally or spontaneously generated in said apparatus.”

[Printed, sd, Drawings.]

A.D. 1865, June 6.—N^o 1548.

KROMSCHROEDER, HENRY HERMANN, and KROMSCHROEDER, JOHN FREDERICK GUSTAV.—“Improvements in dry gas meters.” These are, first, “in constructing the flexible or collapsible chambers of dry gas meters” in place of employing circular discs of metal, and in place of employing strips or fillets of leather fastened or sewn together, as is most generally the practise, the leather for forming the flexible chamber of a dry gas meter is obtained by cutting the central portion from a square or oblong piece of leather. The square or oblong ring of leather so obtained is fixed to two square or oblong frames, the corners or angles of which are rounded off. By this construction the form of the flexible or collapsible chamber will be well adapted to work in a rectangular outer case, besides, there will be no seams in the leather, and the leather is not injured by blocking.

Second, “in constructing a rotary or circular valve of a dry gas meter a conical plug is used, the side or circumference of which is, by preference, slightly hollow in place of being formed with straight lines as would be the case if the plug were truly conical. On one side a recess is formed, passing from the top

" or widest diameter of the plug downwards to nearly the bottom, " this recess is open at top and closed at bottom. Through the " opposite side of the conical plug is a passage passing into the " plug, such passage being open at the bottom and closed at the " top." The conical plug is received into and turns in a seat constructed as follows :—A plate with a central opening through it, on the upper surface of which are four uprights with a ring at their upper ends, " which receives and supports the conical plug, " and embraces it near its upper end. The inner edges of the " uprights and the inner edge of the ring are formed to fit the " conical plug. Between the four uprights above mentioned " are four openings or passages, corresponding in dimensions " with the opening or passage and the recess formed in the opposite sides of the plug."

[Printed, 10d. Drawing.]

A.D. 1865, June 7.—N° 1553.

HOWARTH, JAMES.—(*A communication from John Howarth.*)

" An improved method and apparatus for distilling coal, shale, " and other carbonaceous substances." This consists, first, in distilling these substances " for the production of oils, gases, " vapours, and other volatile products by passing through the " material to be acted upon a current of superheated steam in one " body in a vertical plane, or nearly so, through an upright " retort, that is, so that a body of superheated steam shall come " in contact with every portion of the said material."

Second, " combining devices for superheating steam flues for " the passage of combustion, and a suitable retort or retorts containing carbonaceous materials, as to cause the internal heat or " that caused by the superheated steam to always predominate " over the external heat."

Third, the double chambered upright retorts, all arranged as follows :—The heat and products of combustion pass from the fire chamber through the flues under the tile floors and into a space or oven in which are two vertical retorts resting upon two superheaters. These are of iron, and divided into several chambers communicating with each other by means of partition plates, the purpose of which is to retard the passage of steam through the same, in order that it may be heated to a greater or sufficient degree of heat before reaching the retorts, into the bottom of

which it is conducted by means of tubes. The products of distillation pass through pipes leading from the tops of the retorts to the tar main, from the end or ends of which "they are delivered" and treated in the usual manner."

[Printed, 1s. Drawings.]

A.D. 1865, June 12.—N° 1591.

THOMAS, JOHN.—(*Provisional protection only.*)—"A new material to be used in the purification of heating and lighting gases." This is, as follows:—"The coke of boghead or cannal coal, or the material after the distillation of such coal," is burned or calcined, and the ash or product remaining reduced to powder, and damped with water, is "the new material to be employed by itself, or if not sufficiently porous mixed with saw-dust, ashes, or other suitable material." "The material is to be used in a similar manner to lime or oxide of iron. To improve its qualities for the purifying of gas from sulphur, damp it with lime water or add lime."

[Printed, 4d. No Drawings.]

A.D. 1865, June 13.—N° 1603.

HORRIDGE, EDWARD SAMUEL.—(*Provisional protection only.*)—"Improvements in communicating signals in railway trains." These are effected by means of inflammable gas, and consist in adapting a tap "to each carriage compartment, or as many as may be desired, which tap upon being turned causes the gas to flow along a pipe to the engine, the guard's van, or other desired situation where there is a light constantly burning; this master light effects the combustion of the transmitted gas, and the flame so produced may constitute a signal to the engine driver, guard, or other attendant." Another method is to cause "the gas, when lighted, to burn a cord which holds back a bolt, a whistle, or other alarum, which being thus liberated effects an audible signal." The tap above-mentioned is also connected with a "signal board or any ordinary apparatus, which will indicate the carriage requiring attention. The supply of gas may be taken from the ordinary pipe used for the carriage lamps when that method of illumination is adopted."

[Printed, 4d. No Drawings.]

A.D. 1865, June 20.—N° 1655.

BREWER, EDWARD GRIFFITH.—(*A communication from Ernest Alexander Ribert.*)—(*Provisional protection only.*)—"Improvements in the construction of taps or valves." These are, constructing taps or valves "whereby the cleaning and lubrication of the parts may be carried on without stopping the flow or passage of gas, and without any escape taking place," and the gas may be burning "at the same time." These taps or valves have two plugs, one within the other, and are free to work in a vessel or case which allows the inlet gas to pass through the tap and thence to the supply pipe. This vessel or case, in preference, of cast-iron, "is enlarged at both ends to receive pipes to which the main and supply pipes are joined, and it is formed with, say, four apertures, two of which serve alternately for the passage of gas. The large plug has apertures corresponding in number with those in the case, two of which are in the fore part, and two in that part containing the small plug. When properly set for action the apertures in the front part of the large plug correspond with those in the inlet and exit pipes, and by turning the small plug the supply is cut off." In the door of the box or case, which is closed by a key, is an aperture for a key for opening and closing the inlet tap. To clean the tap the door is opened, two screws holding a guard plate are removed and the plate raised. This exposes another screw, which is also removed in order to turn the larger plug of the valve, which is placed in such a position that the apertures of this plug allow the gas to pass into the pipe supplying the burners without allowing it to pass into the inside or small plug, and the large plug is fixed in this position by replacing the screw previously unscrewed. The small plug "may then be raised for cleaning and lubrication, as gas can no longer pass from the tap by the internal plug." The large plug is lubricated "by pouring oil in passages formed in the upper part of the valve box or case."

[Printed, 4d. No Drawings.]

A.D. 1865, June 20.—N° 1658.

SCHOLL, JOHN.—"Improvements in gas burners." These are, first, "in order to increase the light obtained by burning gas with the ordinary flat burners known as fish-tail and bat's-wing, and with other similar burners," employing a "narrow and thin strip

" of metal (by preference platinum)" fixed "so as to stand in the
" plane of the flame immediately above the burner, the metal
" should be so thin that its edge may not materially interfere
" with the issue of the gas from the burner." To argand and
other ring burners a similar addition is made, "the strips of metal
" being then made into a ring and fixed immediately within the
" circle of holes, the diameter of the thin metal ring being very
" slightly less than that of the circle of holes." Second, in con-
structing fish-tail and other similar gas burners, forming the top
of the burner of thin sheet platinum and securing "the top in its
" place, by preference, by burnishing it down into a recess; the
" holes or slits are then afterwards cut in the platinum in place of
" boring them through the solid metal as usual." In ring gas
burners a ring of thin platinum is burnished into a recess to
receive the circle of holes.

[Printed, &c. Drawing.]

A.D. 1865, June 23.—N^o 1687.

SNELL, HENRY, SAXON, and THOMAS, FREDERICK EDWARD.
—(*Provisional protection only.*)—"Improvements in apparatus
" used in supplying gas to burners." These are, in apparatus so
constructed "in order that when the supply of gas from the main
" is shut off the valves or taps at or near the several burners may
" each be shut off, and not again admit of the flow of gas through
" them till each of the cocks or valves used to regulate and shut
" off the supply to the respective burners has been opened by
" hand." "The form and arrangement of the apparatus are
" capable of various modifications, but it is preferred to employ
" an ordinary stop-cock to each burner, the plug or valve of which
" has a tendency at all times to close by means of the action
" thereon of a spring or otherwise, whilst on the moveable parti-
" tion or diaphragm, or acted on by it, there is a stop or catch,
" which, when the diaphragm is moved by the pressure of the gas
" thereon, retains one end of a lever, which at its other or shorter
" end is in connection with or is acted on by the spring and plug
" or valve of the cock or tap of the burner, so as to retain the
" spring from closing the plug or valve of the cock or tap so long
" as the moveable partition or diaphragm is subjected to the pres-
" sure of the gas. It is preferred that the moveable partition
" should be a disc with flexible material around its circumference,

" in order to fix it and yet allow of its movement to and fro." " In some cases one of such apparatus may be applied to act with several gas burners, in which case each burner would have its own regulating cock or tap; and in place of the cock or tap which acts with the diaphragm or moveable partition being a regulating cock or tap, it may simply act as a supply tap or cock, whilst each burner has its own regulating tap or cock."

[Printed, 4d. No Drawings.]

A.D. 1865, June 26.—N° 1703.

WORSSAM, CHARLES, and EVANS, GEORGE.—" An improved pulping and compressing machine for the treatment of peat as a fuel and gas for illuminating purposes."

This is "a combined apparatus for pulping and compressing peat for fuel and for gas illuminating purposes." A "horizontal circular table" with a number of boxes shaped like a brick, and each with a plunger, rotates "on a circular inclined" spiral tramway, attached to which is a cam for pulling each "plunger down," after delivering its block. The table is fitted with covers, on the top of which are rollers. As the table rotates, the rollers "enter a fixed cam, by which the covers are opened and shut as required. Above is a pug-mill, with a revolving shaft and knives for pulping the peat, which then falls on a drum fitted with blades, by which it is fed down a shoot on to the table. The pug-mill has a steam jacket;" and the boxes are lined with "perforated plates."

[Printed, 10d. Drawing.]

A.D. 1865, June 29.—N° 1732.

LIZARS, GEORGE.—(*Provisional protection only.*)—"Improvements in dry gas meters." These are as follows:—"The diaphragms or partitions of any gas meters which move by the pressure of gas are joined together by a leather which requires an air-tight and firm means of attachment," and for the means of securely fixing the cords or bands which bind this leather on to the ring which surrounds and holds the diaphragm, and of making the joint around the edge of the diaphragm perfectly tight and so avoiding leakage," the metal ring on which the leather rests is formed with a groove around one of its edges; this groove receives the last turn of the cord or twine after it has been

bound over; the leather and edge of the groove is turned over on to this last turn, "so that the metal surrounds and holds firmly the cord and prevents the binding which holds the leather from stretching either by reason of the pressure of the gas or from any other cause."

[Printed, 8d. Drawing.]

A.D. 1865, June 30.—N^o 1737.

SCHOFIELD, WILLIAM.—"Improvements in the manufacture of gas retorts and other articles made of fire-clay, and in furnaces for burning the same, and for other purposes." These are, in reference to this subject, first, "in manufacturing gas retorts it has heretofore been customary to mould and cast them in solid fire-clay mixed with ground burnt fire-clay or other material, and such retorts when in use are very liable to contract and to crack," and this "invention consists in moulding and casting the retorts with a number of perforations distributed over the surface, or the perforations may be made after the retort is moulded." "The retorts are then burnt in the usual manner," or in a furnace with rotating or oscillating grate-bars, and the "perforations are filled up with burnt blocks of fire-clay and cement."

Second, "making screw threads in articles of fire-clay," and in retorts so as to "secure the mouth-pieces of retorts to the retorts by screws taking into threads formed of and in the fire-clay." "When the retort has been moulded and the fire-clay has had time to set, but before it has been burnt," six or other convenient number of holes are made in the body of the fire-clay, forming the end of the retort, and these holes are then tapped with a screw tap, which by turning round gradually displaces the fire-clay until a perfect screw is formed, or "a screw bolt may be imbedded in the fire-clay when being moulded, and screwed out afterwards thus leaving the hole screwed." The retorts are afterwards burnt. This mode of securing the mouth-piece to the retort may be applied to retorts of the ordinary construction.

[Printed, 10d. Drawing.]

A.D. 1865, July 6.—N^o 1780.

BEIGEL, HERMANN.—(*Provisional protection only*).—"Improvements in the means of obtaining or producing oxygen applicable

"to various useful purposes." These are, adding to about 100 pounds of a saturated solution of chloride of lime, "about half an ounce of oxide or salt of nickel or cobalt, the result of this admixture at a temperature of about 80 degrees Reaumer being that chloride of lime is decomposed into chloride of calcium and oxygen, the oxygen being eliminated and set free from the lime; and if the process is effected in a close vessel a tube or pipe will conduct the gas as required." It is also proposed to mix the ingredients in the dry state so as to be readily portable, and to eliminate the oxygen by adding warm water about "a temperature of 90 degrees to urge the elimination." "By adding fresh quantities of chloride of lime the generation of oxygen may be continued without the addition of cobalt or nickel, which undergo no change during the process."

[Printed, 4d. No Drawings.]

A.D. 1865, July 8.—N^o 1809.

BAGGS, ISHAM.—"Improvements in the production of artificial light, and in the apparatus connected therewith." These are said to be, first, the methods of heating the air or gas prepared for the purposes of illumination, and for preventing the condensation thereof, as follows:—The air or gas "such as hydrogen, carbonic oxide, or carbonic acid, or any gas capable of acting as a carrier of inflammable vapour," or "common coal gas," is passed through any convenient and suitable carburetting apparatus containing "benzole, rock oil, petroleum, or any other analogous material," in preference, the air or gas "shall not be passed through the liquid itself so as to cause a backward pressure." The various pipes used are protected "from the cooling effects of the atmosphere by surrounding them with non-conducting materials of any description. A very convenient mode of using the air or gas employed" is by "causing it to heat itself in transitu by one or more burners," placed "under a part of the supply pipe or under any vessel or reservoir through which the air or gas passes." In preference, only a part of the air or gas passes through the heated pipes and meets "the remainder of the supply further on."

Second, producing for the purposes of combustion "inflammable gases or vapours given off, evaporated, or volatilized by contact or proximity with other bodies hotter than from the material

“ from which they are generated. As an example of such substances so employed methylated ether may be particularized.” A reservoir for the ether of brass or iron is perfectly tight when closed, it is in an elevated position, and furnished with a pipe for the supply of the various burners with the vapour, which is evaporated from the liquid ether, the reservoir containing which being allowed to remain at the ordinary temperature, or it may be warmed or heated by means of hot water, &c., and the vapour may be exposed to benzole, &c. For portable lights the ether, &c. may be vaporized in a close tube or other vessel as above.

[Printed, 4*l*. No Drawings.]

A.D. 1865, July 10.—No 1818.

LIVESEY, GEORGE THOMAS.—“Improvements in treating ammoniacal liquors for purifying gas, and other purposes.” These are, in reference to this subject, first, “the desulphuration of gas liquor wholly or in part containing ammonia and sulphuretted hydrogen by bringing the liquor into contact with the gases produced by the combustion of fuel, or the like gases from other sources,” by collecting the gases and “drawing or forcing the same by means of an exhauster or other suitable apparatus through or into contact with the foul gas liquor which may be contained in a vessel similar to the ordinary scrubber.” The liquor thus desulphurated is converted into an active purifying agent, and readily removes the sulphuretted hydrogen from the crude gas upon its being applied through the agency of scrubbers or other suitable apparatus. “The carbonic acid may be removed from the gas by desulphurating the liquor as before described and thus heating it, by which means the greater portion of the carbonic acid in combination with it is driven off and the said liquor then becomes suitable as an agent for the removal of both sulphuretted hydrogen and carbonic acid.” “For the purifying of illuminating gas it is proposed to pass the gas through two vessels containing desulphurated liquor, and next through a “weak desulphurated liquor which has been heated to remove the carbonic acid if required, and finally through” water only to remove the last traces of impurity. It has been found that about one gallon of the desulphurated liquor properly applied is sufficient to purify one hundred cubic feet of gas.

Second, air is used in place of the fuel gases although the latter are preferred, and the sulphuretted hydrogen is carried "into the chimney shaft or burnt in the retort furnaces."

[Printed, 4d. No Drawings.]

A.D. 1865, July 11.—N° 1833.

DUFRENÉ, HECTOR AUGUSTE.—(*A communication from Charles Tellier.*)—(*Provisional protection only.*)—"An improved process for obtaining oxygen." This consists, in reference to this subject, in passing "a mixture of chlorine and water steam" through a tube heated to red heat, decomposition takes place, "the hydrogen combines with the chlorine, and oxygen is set at liberty." "The furnaces employed for these operations may vary in form according to circumstances." The gas thus produced is applied "principally to the production of heat and light by burning in this gas several substances, but especially metals." "Zinc produces a greater heat than iron and in certain cases it should be preferred, especially in that which concerns light, which will give the best results, in consequence of the solid particles produced by its combination with oxygen."

[Printed, 4d. No Drawings.]

A.D. 1865, July 12.—N° 1841.

BLAIR, HARRISON.—"Improvements in the production of gases from aqueous vapour, and in the application thereof to heating purposes." These are, "forcing a mixture of vapour of water and atmospheric air through a fire of coke or coal, and the use of such gases for heating purposes." The furnace described is vertical, built in brick, with fire-bars, and an ashpit with a door which may be closed, opposite to which is a pipe extending through the brickwork with a cover through which is a smaller pipe leading from a steam boiler and which extends into the larger pipe and terminates in a jet; between the cover of the pipe and the jet is a "damper or valve which may be opened or closed so as to admit more or less air into the pipe." The fuel is fed in by a door at the top; there is a door at the side near the top for the introduction of an instrument to rake up the fire, and opposite is a passage "provided with intersecting fire-bricks leaving 'pigeon-hole' spaces for the gas to pass through." "If

"found requisite, a jet of steam may be introduced at the upper part of the furnace to assist the combustion of smoke." The gas may be led to smelting or other apparatus or is led by mains to any "desired situation" or used "for heating by means of stoves or open fires, for domestic or other purposes, the gas may be conducted to holders of ordinary construction and supplied as is usual with ordinary gas."

[Printed, *sd.* Drawing.]

A.D, 1865, July 15.—N^o 1861.

LAKE, WILLIAM ROBERT.—(*A communication from Henry Railton.*)—(*Provisional protection only.*)—"Improvements in flexible gas tubing." These are, first, in the application of glue or a composition, as follows:—"The glue may be dissolved in water with about one-third of molasses, honey, or glycerine," and used hot when "used as a lining or inner coating for the tube it may be poured into (so as to fill) said tube and after remaining long enough to form a film or coating of the desired thickness, the residue of the said glue or composition may be poured out therefrom." "To cover or coat the outside or to saturate the tube the glue or composition may be applied with a brush," or by dipping the tube into a vessel containing the glue or composition.

Second, applying flock to the outside of the tubing, by immersing the tube in a reservoir of cement of about the consistency of paint.

The cement is a solution of gum, india-rubber, or gutta percha. "Before the cement is dry the tube is 'flocked' in any suitable manner," when the flock has set, the operation of dipping and flocking is repeated. When the flock "has become set the tubing is immersed for about fifteen seconds in a bath of nitric acid of the ordinary commercial strength, and then immersed for about thirty seconds in a moderately strong solution of chloride of lime. It is then twice again alternately immersed in the nitric acid and lime water in the same order and for the same time as before. The india rubber being vulcanized by the action of the said acid and lime water the tubing is said to be 'cured.'" This "curing" is not considered essential, "as a very satisfactory result may be obtained by 'flocking'" alone.

[Printed, *sd.* No Drawings.]

A.D. 1865, July 19.—N^o 1875.

METCALF, THOMAS, METCALF, HENRY, and CLAYTON, THOMAS.—(*Provisional protection only.*)—"An improved apparatus for cooling liquids and cooling or condensing vapours or gases." This consists of a cistern through which water circulates in which is placed a zig-zag or serpentine pipe formed of thin metal plates at the top of which is "a nozzle or aperture for the entry of the liquid, vapour, or gas to be cooled, and at the bottom an opening and pipe leading to the exterior of the cistern for the exit." "The sides of the pipe are made flat, the space between them being as narrow as the area of the supply will allow, and one side of the lower part of the zig-zag or serpentine pipe is encased in a chamber open at the top, and connected at the bottom to the cold water pipe for supplying water to the cistern." At the top of the cistern is a waste pipe for taking off the surplus water.

[Printed, 4d. No Drawings.]

A.D. 1865, July 29.—N^o 1968.

KÜP, FERDINAND.—(*Provisional protection only.*)—"Improvements in gas burners. These are "regulating the illuminating effect of either bats'-wing, fish-tail, argand, or other similar gas burners, by regulating exactly the quantity of atmospheric air to be admitted to the gas flame. For this purpose the burner is provided on the outside with a moveable jacket, socket, casing, or cap, having one or more openings through which either the gas flame or the entire top or part of the top of the burner may be caused to protude," provision being made for allowing the setting of the same at any required height and thus allowing more or less air to be admitted to the flame, this is effected, by preference, as follows:—"A male screw thread is cut in the outside of the burner, which screw enters into a corresponding female screw thread provided in the inside of the jacket, socket, tube, casing, or cap, or this latter may be arranged in such manner as to allow of its gliding gently over the smooth outer surface of the burner."

[Printed, 4d. No Drawings.]

A.D. 1865, August 3.—N^o 2009.

HORRIDGE, EDWARD SAMUEL.—(*Provisional protection only.*)—"Improvements in signals for railways." These are, as fol-

lows:—First, two gas pipes are laid along a railway, “the one
 “supplied with gas at a comparatively low pressure, which shall
 “supply a small quantity constantly burning as small jets at any
 “desired situations,” the other “supplied with gas at a higher
 “pressure, and capable of being placed in communication with
 “the first-mentioned pipe by means of ordinary cocks; these
 “cocks are placed at intervals along the line, and when an
 “accident thereon takes place the gaurd runs to the nearest, and
 “by turning it allows the high-pressure gas to flow into the
 “low pressure pipe, the small jets above mentioned as constantly
 “burning immediately become strong lights, which act as signals
 “and through a colored medium if desired.”

Second, using the above, only, the increased pressure causes the
 flame to burn a tape or other such substance which has held an
 arm, which drops, giving the required signals; or the burning of
 the tape liberates an apparatus “which places a fog signal upon the
 “line, which fog signal may be removed when the line is clear
 “by the like burning of another tape.”

Third, using “two or more gas pipes in connection with jets
 “constantly burning within lamps; by turning a cock on either
 “of these pipes a lamp of any desired colour may be lighted from
 “any part of the line.”

Fourth, a tape burned as above liberates an alarum at a station,
 and the master or other official can then signal along the line by
 any ordinary method or by means above described.

Fifth, using the above gas pipes for giving instructions along
 the line, “the gas being turned on and off, and thus affording
 “intermittent flashes, a certain number of which may indicate a
 “particular instruction.”

[Printed, 4d. No Drawings.]

A.D. 1865, August 7.—N^o 2043.

FOUBERT, ADRIENNE ANASTASIE. —“Improvements in appa-
 “ratus for regulating the passage or flow of steam, water, and
 “other fluids.” These are as follows:—At one end of the pipe
 “the steam, water, gas, or other fluid” enters; in the top of the
 pipe is an aperture for the exit of the same, of any desired shape;
 beyond the aperture is a piston on which the pressure is exerted
 and which causes to open or close, more or less, the aperture;
 placed in the chief pipe is a slide pipe to which is attached two

rods, likewise connected with the piston, for communicating a to-and-fro motion to the slide pipe. The motion of the pipe is regulated according to the pressure of the fluid passing through. At the back of the piston is a helical spring resting upon a flanged washer, through which is a set screw for regulating the size of the exit aperture.

In another arrangement, in a tube, the inlet and outlet passages are opposite each other, and there is a slide pipe in the same, to which is attached a rod. At the inlet passage is a cock to which is attached a tubular or hollow spring which is free to yield to the pressure or fluid entering by the cock. The tubular or hollow spring is in connection with balance levers which are attached to the rod which moves the slide pipe. The action is, as the fluid is admitted by the cock it enters the tubular or hollow spring, causing it to expand or contract as the pressure varies, and so causing the sliding tube to rise or fall and open or close the inlet and outlet.

[Printed, 1s. Drawings.]

A.D. 1865, August 12.—N° 2094.

WOODWARD, HENRY.—(*Provisional protection only.*)—"Improvements in gas burners." These are, forming "on the top of the burner at each side of the orifice a grooved arm," and suspending "to each arm a rod or pin carrying a small piece or bead of glass, the groove or channel being for the purpose of spreading the flame and the bead of glass for keeping the flame steady." Also forming "in the chamber below the orifice a valve seating," and placing "in the chamber a valve having grooves in its surface, so that when the gas is turned on it shall press the valve to the seating, and only allow the gas to pass through the grooves, and thus regulate the quantity of gas to be consumed with great certainty and efficiency."

[Printed, 4d. No Drawings.]

A.D. 1865, August 12.—N° 2095.

WOODWARD, HENRY.—"Improvements in carburetting coal gas and manufacturing artificial gas, and in the machinery or apparatus employed therein." These are, first, "for carburetting ordinary coal gas" employing a vessel of suitable shape and material in which are a number of perforated plates

covered with cotton wicks or other material, which plates rest upon a horizontal plate above the bottom of the vessel or chamber, thus leaving a space which is filled with naphtha or other hydrocarbon, supplied by an inlet pipe at the exterior of the vessel. "At the centre or side of the vessel there is a tube connected with the supply of the ordinary coal gas, which tube encloses another tube in a telescopic manner, the second tube having at the bottom a disc carrying one or more floats for enabling the disc to float in the naphtha or other hydrocarbon." The gas, after passing through the wicks, is passed from the vessel through an outlet at the top to the burners.

Second, "in the manufacture of artificial gas," employing similar vessels to those before described and supplying artificial air by means of a blower to the liquid instead of the ordinary coal gas. "In the vessel there is a blower which is wound up when required by a key passed through the aperture, which aperture admits air for the supply of the blower." The blower is an arrangement of shafts or spindles mounted with a train of toothed wheels and pinions, put in motion by a clock or box spring. On one of the shafts is a crank and friction wheel, the crank working a bellows or blower; the friction wheel is acted on by a lever used as a break. Or a rotary fan or blower is employed. In both cases the box spring may be dispensed with, and any other description of motive power employed.

[Printed, 16d. Drawing.]

A.D. 1865, August 24.—N° 2179.

BAGNAGATTI, GIACOMO.—(*Provisional protection only.*)—"An improvement in gas burners." This consists, "in the employment in connection with the upper portion of the said burners of a turn or loop of galvanized platinum wire, which will compress the current of gas and diverge or spread the flame, and at the same time effect a combination of the hydrogen with the oxygen, and develop caloric to such a degree that the platinum becoming in an incandescent state will increase the combustion of the hydrogen."

[Printed, 4d. No Drawings.]

A.D. 1865, August 25.—N° 2184.

CURLEY, EDWIN AUGUSTUS.—(*Letters Patent void for want of Final Specification.*)—"Improvements in apparatus by means of

" which certain liquids, common air, and certain elastic fluids are
" made available in the production of light, and their quantity
" regulated and measured, parts of which improvements are
" applicable for other purposes." These are, in reference to this
subject, as follows :—A " rotating drum, resembling the measuring
" drum of a wet gas meter, is a very convenient apparatus,"
surrounded with a case which is provided with an inlet and an
outlet for the air, all sealed or coated in the usual manner. A
train of wheels and pinions, or of pulleys, are connected with the
axle of the drum and set in motion by a weight or spring, &c., the
drum is made to revolve, and consequently to draw the air through
the inlet of the case on the one side, and to force it through the
outlet on the other side. To impregnate the air with inflammable
vapours or gases porous or fibrous diaphragms are in the drum,
and it is partially filled with the inflammable liquid, but it is better
to have the inflammable liquid in a separate chamber connected
with the upper part of the drum case so that " the air passing
" through the drum passes through it." In this chamber are
revolving " disks," and liquid is supplied by " an apparatus on
" the principal of the hydrostatic fountain." A partition is made
" between the fountain and the lower part of the evaporating
" chamber, and small portions of the liquid from the lower level
" of the fountain are raised and caused to flow into the evapora-
" ting chamber at a higher level by a suitable attachment to the
" axis of the revolving disks before-mentioned." Any excess in
the chamber runs back to the lower level of the fountain. This
compensating apparatus is applied " for the purpose of main-
" taining a uniform level of liquid in wet gas meters, gas regu-
" lators, and gas holders." Instead of this fountain arrange-
ment, sometimes using a reservoir for the liquid connected with
the evaporating chamber by a pipe which is stopped " by the
" rising, and opened by the falling of a mercurial valve which
" is moved by a float in the evaporating chamber, or in a float
" chamber connected therewith. The mercury is contained in a
" small vessel made of a composition, as vulcanite, or ebonite, in
" such a form that, reversing the apparatus will not cause the
" mercury to be spilled." This arrangement is also applied " to
" gas meters, gas holders, and gas regulators." Means are used
" to regulate the amount of evaporation and the quantity of
" inflammable liquid used." A small jet of flame is used to heat
the liquid in the evaporating chamber, " increased or diminished

" by a valve, while it may be extinguished by a cock." Means are employed to make this valve self-acting. Instead of using a revolving drum as above, the same object is accomplished "by using one or more bellows." An arrangement of a series of bellows is described. Dispensing with the contrivance for producing the flow of air, the evaporating chamber is applied to a gas meter to "impregnate the gas with inflammable vapours to any required extent." Instead of the rotating drum sometimes using "one or more reciprocating pumps sealed with liquid like the large gas receivers used for storing gas at the works. Self-acting valves are attached to these, and they are worked by means of a spring or weight."

[Printed, 4d. No Drawings.]

A.D. 1865, August 29.—N^o 2219.

TERREL, HULL, and DON, THOMAS.—(*Provisional protection only.*)—"Improvements in the method of and apparatus for treating peat and other plastic materials." These are, as follows:—The raw peat is prepared "for fuel and to obtain gas," by first delivering it "into a jacketted pug mill heated by steam or otherwise, and is then passed through a macerator," preferring for the purpose Buckland's, described in No. 2218, A.D. 1859. The peat is then conveyed to the moulds "from hoppers or shoots, in which work feed plungers driven by cams or the like, to which motion is transmitted by chain wheels or otherwise." Each block is cut off by knives or cutters; the moulds are cellular or hollow to admit steam or other agent to heat the peat. The peat is then conveyed to a drying apparatus which consists of a number of chambers one above another in which trays containing the peat are placed, and these gradually travel through the chamber; heated air is admitted by slots laterally or across the trays, then escapes from the chamber through similar slots. The air is exhausted by an exhaust fan or other means. The dried peat is afterwards carbonized in an oven provided with a fire-box or furnace, in which the fuel, instead of resting on fire-bars, lies on a shelving bed; jets of gas, which may be obtained from the peat in the furnace, are driven into the furnace. "The gases given off are carried through an outlet exhausting pipe or still head into a condenser to be collected and utilized. The waste heat may be carried to and used in drying apparatus." "The

" invention may be applied to other plastic materials besides
" peat."

[Printed, 4d. No Drawings.]

A.D. 1865, August 31.—N° 2247.

NEWTON, WILLIAM EDWARD.—(*A communication from Albert Hamilton Emery.*)—"Improvements in obtaining spirits of turpentine, rosin, pitch, tar, pyroligneous acid and other products from wood." The other products named are "gas, charcoal, and wood naptha" and these and the products named in the title are, it is said, obtained "directly from pine wood by one operation" as follows:—"The wood is placed in iron retorts which may be heated externally and a stream of steam is let into the retort. "As soon as the condensation of the steam ceases or partially ceases the pressure of the steam in the retort rapidly forces the heat through the mass of wood until the heat reaches from 300° to 320° F., when the valve which connects the retort with a condenser is opened and the vapors containing water and spirits of turpentine pass over into the condenser and are condensed, the spirits rising on to the top of the same. This process continues several hours, the heat is gradually raised until the wood begins to char and forms acid, gas, and other products, at which time a large portion of the turpentine spirits have passed through the condenser. This process is hastened and the yield of spirits in this part of the operation much increased by reducing the pressure of the vapours in the retort to two or three pounds per square inch by the aid of air pumps and condensers or otherwise." When the pressure is thus mainly removed it is difficult to prevent charring the wood without the use of superheated steam. The products are carried through condensers which finally separate all the other products from the gas.

[Printed, 4d. No Drawings.]

A.D. 1865, September 1.—N° 2259.

HORSLEY, CHARLES.—"Improvements in meters or apparatus for measuring water or other fluids, partly applicable for exhausting air or other gases." These are, in reference to this subject, as follows:—"For exhausting air or gases a case or cylinder of suitable capacity is employed in combination with a revolving drum fixed on an axis and placed eccentrically within

“ the cylinder and having two or more moveable flaps or vanes
“ which open by centrifugal action or are actuated by means of
“ an eccentric, cam, or other suitable mechanical contrivance, the
“ flaps being closed in their revolution by contact with the inner
“ circumference of the cylinder. Each flap or vane discharges
“ the air or gas in front of it in each revolution by closing within
“ the circumference of the drum at or before its contact with
“ drum and cylinder, recesses or openings being made upon the
“ circumference of the drum to receive the flaps or vanes. The
“ inlet and outlet passages are so placed and arranged that no air
“ or gases can possibly return. Suitable packing is used to prevent
“ the air or gases passing the ends of the drum or flaps, and one
“ or both ends of the axis of the drum passes through the ends of
“ the cylinder through stuffing boxes, a rigger or other driving
“ apparatus being attached to the axis, by which means motive
“ power may be given to the exhauster.”

[Printed, 8d. Drawing.]

A.D. 1865, September 9.—N^o 2308.

MACKIE, ALEXANDER, and PATERSON, JAMES.—(*Provisional protection only.*) — “ Certain improvements in the method of
“ lighting gas and in apparatus connected therewith.” These
are, it is said, for “ lighting of jets of gas not readily accessible,
“ such as high gas lamps, signal lights, or in subterranean
“ passages or tunnels,” and consist “ in the application and
“ use of a tube extending from any place which may be con-
“ venient for ignition to the jet required to be lighted.” This
tube is perforated with small holes close together, extending from
end to end, and it is supplied with gas which is controlled by a
tap. When it is required to light the jet the gas is “ turned on ”
to it and to the perforated tube, and a light “ applied to the
“ perforations at the accessible end of the tube, the light will pass
“ in small jets along the perforated tube to the jet requiring
“ ignition, and communicate light thereto, after which the gas
“ supplying the perforated tube is to be ‘ turned off ’ until again
“ required.”

[Printed, 4d. No Drawings.]

A.D. 1865, September 11.—N^o 2329.

WEBB, CHARLES JAMES. — “ Apparatus applicable to the
“ lighting and reviving of fires.”

A number of gas burners are arranged below the grate, formed with an open chamber at the lower part for the inlet of air, and an inclined and tapering passage above, with its orifice in a vertical plane. The gas and air thus burn together with a blue flame, entering into and lighting up the coals.

[Printed, *8d.* Drawing.]

A.D. 1865, September 16,—N^o 2372.

ESSON, WILLIAM.—“Improvements in the construction of gas “meters.” These it is stated are mechanical arrangements based “upon an invention” described in No. 1942, A.D. 1858, and are said to be, first, “instead of placing the air tube on the outside of the filling tube as formerly, it is in this instance placed “in the plate forming the bottom of the fountain specially “arranged for its reception, a portion being raised to some “distance above the lowest level of this plate, so as to leave “the bottom of the air tube with free access to the water and “gas. The seal tube is fixed to the top of the meter case in the “usual manner and dips to the bottom of the fountain, a depth “sufficiently low to ensure the seal. The upright spindle passing “through the tube into the compartment of the meter below the “fountain by means of a hole in the fountain plate, the difference “between the levels of the bottom of air tube and seal tube “constituting the seal.”

Second, “a modification of the above in which the meter is “constructed generally as in the preceding arrangement, with “the exception that a diaphragm is carried below that portion of “the fountain plate into which the air pipe is fixed; in this “diaphragm a small hole is made, through which passes the “water from the air pipe chamber.” “At the back of the air “chamber a vertical diaphragm is placed, whose upper edge is “higher than the bottom of the air pipe, the chief use of which “is to cause the whole of the water to pass from the air pipe “chamber to the compartment below through the small hole in “the bottom diaphragm.”

Third, in another modification “the seal tube is dispensed with “and the air tube is situated in that part of the fountain plate “where it is usual to fix the seal tube, the air tube serving both “for the passage of the gas to the fountain as well as for the “index spindle.” In connexion with this modification “an air-

"tight index box is used, but as it is desirable to prevent any
"direct communication between the index box and the fountain,
"the spindle box is surrounded by a stuffing of tallow, grease, or
"other fatty matter."

Fourth, in another modification "the air tube is placed in one
"corner of the fountain case near to the filling tube, the bottom
"fountain plate being raised at this point to form a chamber for
"the opening of the air pipe into the compartment below."

Fifth, in another modification "the bottom fountain plate is
"made level throughout its whole length, and the air pipe dips
"into the water at the back of the case, and communicating with
"the fountain by means of a passage either inside or outside the
"case, a hole being also formed to continue the passage through
"the back fountain plate."

[Printed, 1s. 10d. Drawings.]

A.D. 1865, September 23.—N° 2435.

JOHNSON, JOHN HENRY.—(*A communication from Erasmus Allington Pond, Mark Staples Richardson, and Edmund Alonzo Morse.*)—"Improvements in generating illuminating gas and in
"the machinery or apparatus employed therein." These are, for
the purpose of "charging atmospheric air or other gases with the
"vapors of hydrocarbon fluids," "it is proposed to combine
"with an air pump a vaporizer, consisting of a hydrocarbon fluid
"reservoir provided with a funnel-shaped bottom, which ter-
"minates in a pipe. This pipe may or may not be coiled, but
"its extremity is turned upwards, and is connected with an air
"chamber provided with a double-acting diaphragm air pump
"operated by any convenient arrangement of spring power clock-
"work" or otherwise. "Valves for the emission and expulsion
"of air or other gas to and from the air chamber are arranged
"so that at each stroke of the pump" they are admitted into the
air chamber and forced out through the pipe or coil into the fluid
reservoir, whence they escape through another pipe or pipes
leading to one or more burners. "In cases where the hydrocarbon
"fluid reservoir is subjected to violent motion or shaking the
"flow of the gas is liable to be occasionally either wholly or
"partially interrupted." "To obviate this, it is proposed, to
"provide in the fluid vessel, and below the outlet of the gas, a
"spherical shield or cover, with a hole in the centre through
"which the gas escapes." "It is also proposed to regulate and

“ divide the current or flow of air or other gas into as fine streams
“ as possible as it passes through the pipe or coil in connection
“ with the hydrocarbon reservoir by means of finely perforated
“ diaphragms or wicks drawn through such pipe or coil, or by
“ other equivalent means.” There is a supply reservoir.

[Printed, *ed.* Drawing.]

A.D. 1865, September 23.—N^o 2439.

NEWTON, ALFRED VINCENT.—(*A communication from John Irwin.*)—“ Improved apparatus for generating illuminating gas.” This consists in “arranging a carburetting apparatus,” provided with an inlet for air and an outlet for gas, above the point of “combustion,” as follows:—It is stated that hitherto atmospheric air when carburetted with the volatile portions of naphtha has been considered lighter than air “but this invention is founded upon the theory and discovery that the specific gravity of the carburetted air is heavier than that of ordinary atmospheric air.” “The carburetting apparatus consists of a close metallic pan or vessel provided with a series of vertical partitions which extend from the bottom to the top of the vessel and are arranged so as to form a zig-zag passage for the current of air through the carburetter. The air enters the carburetter through a covered perforated plate, and passing through the zig-zag passage rises as carburetted air into a dome, whence it flows down into a pipe leading to the burners. The apparatus should be filled about two-thirds full with naphtha. To put the apparatus into operation at first a current of air must be propelled through the same by some mechanical means, until the carburetted air thus produced fills the dome and rises and flows down in the carburetted air supply pipe, after which the operation is automatic, the only attention required being to keep the apparatus supplied with naphtha or its equivalent. The automatic downward flow of the gas creates a vacuum in the carburetter which is supplied by a rush of external air into the carburetter.” A serpentine arrangement may be substituted for the zig-zag one.

[Printed, *ed.* Drawing.]

A.D. 1865, September 26.—N^o 2465.

NEWTON, ALFRED VINCENT.—(*A communication from George Washington Edge.*)—“ An improved mode of decarbonizing

"retorts." This consists in decarbonizing retorts by the injection of steam and air substantially as follows :— The apparatus used consists, in preference, of an air pipe with a funnel-shaped mouthpiece which passes through a hole within the head of the retort, and reaches nearly to the bottom; this pipe may be supported by bricks. A small steam pipe extends transversely through the funnel-shaped mouthpiece, and from which a nozzle extends in the direction of the axis of the air pipe. When steam is injected through this pipe, the current issuing from the nozzle causes a draught in the air pipe, and a mixture of steam and air rushes into the retort, which in its passage through the pipe becomes highly heated, and "when it comes in contact with the carbon or soot adhering to the inner surface of the retort, it decomposes the same, so that it passes off in the form of gas, and the retort is thereby cleansed and rendered as good as new." In place of the air pipe above passing "through a suitable hole in the retort," a supplementary head may be provided, which can be attached to the mouth of the retort in place of the regular head.

[Printed, 8d. Drawing.]

A.D. 1865, September 29.—N^o 2503.

COTTERILL, CHARLES FORSTER.— "Improvements in connections for, and in stopping pipes used for conveying water and gas, and for other like purposes, and in preventing leakages in the said pipes, and in apparatus employed therein." These are, first, making a connection to a main water pipe by fixing on that part of the pipe at which the connection is to be made, a circular strap or collar made in halves and firmly clipping the pipe so as to form a permanent part thereof, these halves or collars are fixed together and to the pipe by flanges through which screws are passed; underneath the strap or collar is a washer or ring of india-rubber or leather; a screwed hole is made in the strap and collar and in the washer. Through these holes the drill is passed, and held to the pipe by a frame or clamp of the ordinary or any kind. Above the screwed hole is "an inverted tundish or conical vessel," through a hole in the summit of which the drill passes. This tundish, when the drill has penetrated through the pipe, prevents the water from striking and wetting the workmen using the drill, and is particularly

useful when the water in the main is under pressure. After the hole has been drilled through the clip or collar and pipe, a pipe for the private supply is screwed into the screwed hole, and the connection completed. This is applicable to earthenware as well as to iron water pipes, and may be applied to gas pipes.

Second, for temporarily stopping the open ends of earthenware pipes for the conveyance of gas, water, &c., "during the laying of the said pipes." Near the end of the pipe to be closed fixing two semicircular clips, to which a rectangular frame is connected carrying a strong screw. Upon one end of the pipe a disc or valve of iron is placed, having on its face an india-rubber or leather disk or washer. By placing this "disc or valve against the open end of the pipe and driving home the end of the screw so as to make it bear against the side valve, the said valve is held very securely against and in close contact with the pipe, and the said pipe effectually stopped."

Third, stopping fractures or leakages in earthenware pipes used for conveying gas and water, &c., by means of circular clips or collars of earthenware or sheet iron made in halves. Into the space between the clips or collars and the exterior of the pipe pouring in a liquid state through a hole in the clips or collars, "the filling composition" described in No. 1058, A.D. 1865. When the fractures in the pipes are small, they are covered "with a band or piece of india-rubber, gutta percha, or leather," and fixed "by the semicircular clips," the filling composition being dispensed with.

[Printed, 8d. Drawing.]

A.D. 1865, October 3.—No 2535.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Gustave Renard and Amedée Lipman.*)—"Improvements in apparatus for decomposing and superheating liquids, vapours, and gases." These are, producing oxygen by the decomposition of sulphuric acid, as follows:—The apparatus consists of one or more U-shaped tubes "of metal (cast iron), or other substance capable of resisting more or less high temperature placed in a furnace or heating chamber, and containing inside fragments of material (silex or sand) without chemical action upon the liquids, vapours, or gases placed in contact with them." At one end of the apparatus the acid is introduced by means of a funnel with a

regulating cock; "the acid vapour passes through the sand, and
"is decomposed thereby into oxygen and sulphurous acid which
"issue from the outlet pipe" into a gasholder. "In order to
"separate these gases they are subjected to a pressure of 3 or 4
"atmospheres to liquify the sulphurous acid; the oxygen re-
"mains free in a gaseous state, and by a slight washing all trace
"of sulphurous acid is removed. However, when once the sul-
"phuric acid is decomposed, any means practised in chemistry
"for the separation of the gases may be followed."

[Printed, *8d.* Drawing.]

A.D. 1865, October 4.—N^o 2549.

WEBSTER, JAMES.—"Improvements in gas meters." These are
first, for regulating the flow of "gas by constructing the drum,
"of such meters with fans, the blades of which are fixed helically
"or in screw form around the centre drum or spindle."

Second, forming the chamber for the induction pipe "at the
"end of the drum instead of centrally, the induction pipe being
"placed as usual."

In the outer casing is a drum floating in water, in which the
screw is fixed upon a hollow spindle hung upon a solid spindle,
upon which is a worm by which the registering index is worked
through a shaft; the gas enters by the induction pipe, and
passing through a syphon emerges into the drum, and in its
passage through the fans of the screw causes the drum to re-
volve, and thus work the hands of the index, and the gas passing
through the screw escapes through the induction pipe at the top
of the outer case. "The remaining parts of the meter, namely,
"the float, the valve, and the water caps are, as well as the
"registering apparatus, the same as in meters of the ordinary
"construction."

[Printed, *8d.* Drawing.]

A.D. 1865, October 10.—N^o 2615.

PARKES, JOHN JOSEPH.—"Improvements in the manufacture
"of railway station and other gas lamps." These, it is said
relate to lamps described in No. 1876, A.D. 1862, the object being
to produce a glazed lamp, the frame of which shall throw little
or no shadow, at the same time being strong, and readily lighted

and cleaned. Making "the ribs which stand in a vertical plane
" of a strip of copper or other metal drawn into the form of a
" round bead in cross section with narrow flanges, one on either
" side throughout the length. The parts of the metal where
" curled to form the bead do not touch, a narrow space being
" left between for the reception of a rib or feather piece on edge,
" which projects from the flat or flange side of the bead and
" inside the lamp. These ribs are united in a circular band
" above and below, pins entering the ends of the beads through
" the bands, & the whole being riveted and soldered together. A
" metal band is carried round at the largest diameter of the
" lamp, united to the whole of the upright ribs; this mid band is
" of a half round bead-like form with flanges, and of larger size
" than the upright ribs, which are dovetailed across and into it,
" flush on the inside. This band is also strengthened by a rib on
" edge in the interior of the bead, which is introduced in sections
" between the feathers of the upright ribs, and flush therewith;
" these projecting ribs or feathers inside the lamp serve to receive
" the glass which is puttied therein and introduced from the
" inside. There are six (more or less) pieces of glass in the upper
" half, and six in the lower, each piece being in form of section
" of a sphere. The top ring is double, one part being fixed to
" the upright ribs, the other part fitting within the fixed one,
" and rotating therein freely, but held by pins working in slots;
" this movable ring supports the door of the lamp at the top,
" which door consists of one of the panes of glass fixed in a
" separate frame; the door is further supported at bottom by a
" part or parts fitted in a slot or slots in the large mid bead, in
" the direction of which it is traversed round in opening or
" closing the said door. This door is formed of a light frame
" of U-shaped metal to receive the glass and lie close on the
" outer surface of the lamp." The glass is received at its upper
" edge between two flange-like parts of the upper fixed rings.
" These lamps are suspended by three rods or tubes, one forming
" the gas duct which unite with the lamp at equidistant points
" around the mid bead, and at points where the upright ribs
" intersect." To make the junction of the suspending parts apply-
" ing " a ball or enlarged like piece, having at one part a four pronged-
" like projection which fits on and embraces the intersecting parts,
" of the ribs and mid band, the whole being fixed through with
" a pin and soldered in that pendant conducting the gas." The

four pronged-like piece is made "separate from the enlargement, " which in this case embraces also the stop tap, the parts being " fixed together by a hollow nipple instead of the pin before-mentioned, but also soldered in addition. The gas passes " from this point to the burner through one of the upright ribs;" an "upright stand pipe from bottom ring and gas rib carries " the burner. The feather in the gas rib is omitted in the interior of the bead to leave the channel free." The top piece or canopy in which the three rods unite, is cast hollow in one piece, and the whole of the metal is tinned "to protect it from the " action of the gas."

[Printed, 1s. 4d. Drawings.]

A.D. 1865, October 11.—No 2620.

CRUTCHETT, JAMES.—"Improvements in the manufacture of " gas." These are, first, "the manufacture of gas for lighting " and heating purposes from pulverized or fine coal or other " carbonaceous materials injected into retorts or ovens in small " quantities, either by separate successive injections, or in small " continuous currents."

Second, "the injection into retorts or suitable ovens or chambers, of pulverized, powdered, or small coal, sawdust, oils, or " carbonaceous materials by means of steam supplied to such " retorts in separate charges or in continuous currents."

Third, "the injection of suitable carbonaceous materials as " aforesaid for the manufacture of gas into retorts, ovens, or " heated chambers by separate successive injections, or currents " by means of compressed atmospheric air, compressed gas, " springs, or other mechanical means," "whether the interiors of " such retorts be under a light degree of pressure or vacuum."

"The pulverized coal or other carbonaceous materials may be " carried forward from the main reservoirs along troughs by " spiral screws, or scrapers, or belts, or lines, and thus supply " various hoppers from whence each retort or oven receives its " supply for injection or small current by means of valves, slides, " or other suitable mechanical arrangements. Each small dose, " or charge, or current as soon as delivered becomes acted on by " steam or gas " which scatters the charge all over the interior of the retort, and "the generation of gas is instantaneously " accomplished."

[Printed, 4d. No Drawings.]

A.D. 1865, October 12.—N° 2630.

LERENARD, AUGUSTE AIMÉ.—“A new composition of india-rubber mastic or cement, made in a more or less fluid state according to the use to be made of it, and the process or contrivance for applying the same.” These are, in reference to this subject, as follows:—In making a cement or mastic “for making steam joints,” “to make 36 pounds of mastic, I take about 12 lbs. of solution of indian rubber, 6 lbs. of rag paper pulp, 12 lbs. of plastic clay, 4 lbs. of red ochre or other colouring material, and $2\frac{1}{2}$ lbs. of flower of sulphur, total, $36\frac{1}{2}$ lbs. As evaporation will decrease the weight of the materials used. in weighing them a trifle more than the weight ought to be taken of each. For water or gas joints sulphur must not be added to the mixture, and for gas joints more paper pulp must be added.” In preparing the solution of india-rubber used above, the india-rubber, “vulcanized or not,” is triturated “in the cold between rollers by the usual process,” and dissolved in thick tar oil obtained in the purification of illuminating gas;” and then this mixture is put into a “suitable kettle set directly on the fire, taking care, however, to cover it so as to prevent the escape of gas, which if ignited would be dangerous. This gas can be conveyed out of the kettle by a suitable tube.” The pulp is prepared by taking rag paper, steeping it in water for about 24 hours, beating it thoroughly, and boiling it for at least an hour with a solution of caustic potash, “to take off or destroy the size,” when it is pounded, dried, and mixed by rollers with the india-rubber solution and other ingredients.

[Printed, 10d. Drawing.]

A.D. 1865, October 21.—N° 2719.

BAGGS, ISHAM.—“Improvements in the manufacture of inflammable gases, and in their application to useful purposes.” These are as follows:—“In this instance a retort or appropriate vessel is filled with turnings, shavings, or pieces of iron” and heated to a red heat, when a jet of steam from a boiler is passed over the iron turnings, the steam is decomposed, oxide of iron remains in the retort, and hydrogen gas is collected in a gas holder. The next operation is to “pass carbonic acid gas (however derived or produced) through or over red hot

" or ignited coke or carbon," "the result of this operation is
" that one volume of carbonic acid in passing through or over
" the ignited coke or carbon, takes up an additional equivalent
" of the latter, and is thereby converted into two volumes of
" carbonic oxide gas, which latter gas then passing on through
" the retort or vessel containing the oxidised iron," reduces the
iron to the metallic state capable of again decomposing steam.
" In practice only about one half of the carbonic oxide produced
" as above described " is used for the reduction of the oxide of
iron to the metallic state. The other half may be passed into the
hydrogen gas holder, in which case it mixes with it and is supplied
for the production of light and heat. Other metals which
decompose steam at a red heat may be employed in place of the
iron, and when they are liquid at a high temperature the steam
should be passed or made to bubble through them. By the above
process carbonic acid is converted into carbonic oxide and mixed
" with atmospheric air or with hydrogen or with any other gas
" suitable in such combination for the purposes of heat or illumination."
As the case may be the carbonic oxide or hydrogen
may be burned "separately or combined and either with or
" without the carburization." If carbonic acid gas is required
free from nitrogen it is made from chalk or some carbonate with
an acid.

[Printed, 4d. No Drawings.]

A.D. 1865, November 1.—N^o 2818.

WOOD, CHARLES HENRY, and BARRET, EDWARD LOUIS.—
(*Provisional protection only.*)—"An improved mode of purifying
" gas." This consists in removing the sulphur or reducing "the
" proportion which at present exists in purified coal gas" by
means of soda waste; in preference, the soda waste as produced at
soda works is placed in vessels such as are now used for purifying
gas with oxide of iron, and the gas is passed through it "either
" before or after the gas has undergone its ordinary purification,"
but in some cases, it is desirable to boil the soda waste with water
and to wash the gas with the resulting solution. It is preferred
" to employ the soda waste in as fresh a state as possible " as
" by long exposure to air it undergoes oxidation and is then not
" so efficient in its action."

[Printed, 4d. No Drawings.]

A.D. 1865, November 2.—N° 2833.

WEBSTER, JAMES.—“Improvements in generating and applying
“ certain gases, and in apparatus to be employed therein.” These
are, first, in the generating of gases by forcing currents of atmo-
spheric air through mineral turpentine, naphthaline, or rock oil,
or any oil or spirit consisting of a similar base; and, second, the
apparatus used in making and applying such gases.

A cylinder is employed, the lower part of which is charged with
the oil or spirit supplied through a tube from a reservoir above,
into which the air is forced by bellows worked by a treadle by
which air is driven through a tube into a reservoir or drum. To
this drum are connected a series of vertical tubes extending from
the under side of the drum to the bottom of the cylinder; these
tubes are, by preference, formed alternately of copper or zinc, and
have their lower ends immersed in the oil or spirit, the upper
ends being fixed in a block of wood or other non-conductor.
The air is forced through the tube into the drum and from thence
through the vertical tubes into the oil or spirit and in its passage
absorbs a portion of the oil or spirit, driving it up the outer
cylinder into and through a mass of sponge or pumicestone, &c.
when it issues as gas from a pipe in the top. When using this
apparatus as a blow pipe a flexible tube is attached to this pipe to
which is fixed a two-way nozzle pipe. The gases issuing from
the cylinder through the flexible tube are stopped by the stop
cock which regulates the supply to the two tubes above it; these
two tubes meet again at a junction whence they are conveyed to
the nozzle by two tubes one within the other. The gas being
lighted at the nozzle the bellows are worked. “To apply these
“ gases and their generator for cooking or other like purposes
“ any number of these nozzles may be employed.”

[Printed, 10d. Drawing.]

A.D. 1865, November 10.—N° 2893.

MYERS, EDWARD.—“Improvements in the arrangement and
“ construction of wet gas meters.” These are, first, to prevent
any fraudulent abstraction of unmeasured gas, the “inlet pipe or
“ passage conducts the gas into an internal chamber or passage
“ formed in the upper part of the waste water chamber, and this
“ internal chamber is in communication with and conducts the

" gas to the measuring drum by means of a pipe; a pipe descends
" from the internal chamber to considerably below the water line
" in the waste water chamber, such pipe serving to carry off any
" condensed water from the inlet passage. A bent pipe is applied
" to the overflow orifice, which is at the upper part of the waste
" water chamber; the lower end of this bent pipe is surrounded by
" another pipe or cylinder, closed at the bottom but open at the
" top, to permit the waste water to flow into it and up the overflow
" pipe."

Another mode for the above purpose consists in "conducting
" the gas from the inlet pipe into an internal chamber formed
" in the upper part of the waste water chamber into which the
" gas passes through a valve having a float attached thereto,
" and when the water in the waste water chamber descends by
" accident or design below a certain level or below the overflow
" orifice the float descends and closes the valve in the internal
" chamber, thus cutting off the passage of the unmeasured gas to
" the waste water chamber, and from it to the pipe or passage which
" conducts it to the measuring drum." "To the lower end of
" the tube which surrounds the stem of the inlet valve attached to
" a float within the fountain chamber" fixing "a stay or bracket
" to support the tube in its position, and to serve as a guide for
" up and down movement of the float."

Second, improvements which are applicable to wet gas meters
such as were described in Nos. 1942, A.D. 1858, 1592, A.D. 1863,
and 3059, A.D. 1864, and to other meters of a similar character
wherein a supply fountain is employed and they relate to the
arrangement of the passages, and consist in forming "two open-
" ings between the measuring drum and the air tube or fountain
" chamber, one orifice being comparatively small near the bottom
" of the chamber below the water line, communicating with the
" water in the measuring drum, an opening or orifice of corre-
" sponding size being formed between the drum and the reservoir
" or water supply chamber to adjust the level of the water in the
" two chambers." Another opening of suitable size is formed in
the upper part of the air tube or fountain chamber above the
water line for the escape of the measured gas to the outlet pipe.
By this arrangement of the passages the agitation of the water
line in the fountain chamber and the unsealing of the orifice in
the air tube is prevented.

A.D. 1865, November 2.—N^o 2833.

WEBSTER, JAMES.—“Improvements in generating and applying
“ certain gases, and in apparatus to be employed therein.” These
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spheric air through mineral turpentine, naphthaline, or rock oil,
or any oil or spirit consisting of a similar base; and, second, the
apparatus used in making and applying such gases.

A cylinder is employed, the lower part of which is charged with
the oil or spirit supplied through a tube from a reservoir above,
into which the air is forced by bellows worked by a treadle by
which air is driven through a tube into a reservoir or drum. To
this drum are connected a series of vertical tubes extending from
the under side of the drum to the bottom of the cylinder; these
tubes are, by preference, formed alternately of copper or zinc, and
have their lower ends immersed in the oil or spirit, the upper
ends being fixed in a block of wood or other non-conductor.
The air is forced through the tube into the drum and from thence
through the vertical tubes into the oil or spirit and in its passage
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apparatus as a blow pipe a flexible tube is attached to this pipe to
which is fixed a two-way nozzle pipe. The gases issuing from
the cylinder through the flexible tube are stopped by the stop
cock which regulates the supply to the two tubes above it; these
two tubes meet again at a junction whence they are conveyed to
the nozzle by two tubes one within the other. The gas being
lighted at the nozzle the bellows are worked. “To apply these
“ gases and their generator for cooking or other like purposes
“ any number of these nozzles may be employed.”

[Printed, 10*l*. Drawing.]

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“ construction of wet gas meters.” These are, first, to prevent
any fraudulent abstraction of unmeasured gas, the “inlet pipe or
“ passage conducts the gas into an internal chamber or passage
“ formed in the upper part of the waste water chamber, and this
“ internal chamber is in communication with and conducts the

“ gas to the measuring drum by means of a pipe ; a pipe descends
“ from the internal chamber to considerably below the water line
“ in the waste water chamber, such pipe serving to carry off any
“ condensed water from the inlet passage. A bent pipe is applied
“ to the overflow orifice, which is at the upper part of the waste
“ water chamber ; the lower end of this bent pipe is surrounded by
“ another pipe or cylinder, closed at the bottom but open at the
“ top, to permit the waste water to flow into it and up the overflow
“ pipe.”

Another mode for the above purpose consists in “ conducting
“ the gas from the inlet pipe into an internal chamber formed
“ in the upper part of the waste water chamber into which the
“ gas passes through a valve having a float attached thereto,
“ and when the water in the waste water chamber descends by
“ accident or design below a certain level or below the overflow
“ orifice the float descends and closes the valve in the internal
“ chamber, thus cutting off the passage of the unmeasured gas to
“ the waste water chamber, and from it to the pipe or passage which
“ conducts it to the measuring drum.” “To the lower end of
“ the tube which surrounds the stem of the inlet valve attached to
“ a float within the fountain chamber” fixing “a stay or bracket
“ to support the tube in its position, and to serve as a guide for
“ up and down movement of the float.”

Second, improvements which are applicable to wet gas meters
such as were described in Nos. 1942, A.D. 1858, 1592, A.D. 1863,
and 3059, A.D. 1864, and to other meters of a similar character
wherein a supply fountain is employed and they relate to the
arrangement of the passages, and consist in forming “two open-
“ ings between the measuring drum and the air tube or fountain
“ chamber, one orifice being comparatively small near the bottom
“ of the chamber below the water line, communicating with the
“ water in the measuring drum, an opening or orifice of corre-
“ sponding size being formed between the drum and the reservoir
“ or water supply chamber to adjust the level of the water in the
“ two chambers.” Another opening of suitable size is formed in
the upper part of the air tube or fountain chamber above the
water line for the escape of the measured gas to the outlet pipe.
By this arrangement of the passages the agitation of the water
line in the fountain chamber and the unsealing of the orifice in
the air tube is prevented.

Third, in place of forming a separate chamber within the front or fountain supply chamber for the air tube and overflow pipe as heretofore in the construction of wet gas meters furnished with supply fountains, arranging "the air tube and overflow pipe within the drum case behind the back plate of the front chamber. In this arrangement a passage is formed between the upper end of the air tube and fountain chamber, the lower end of the overflow pipe forming part of the air tube being so arranged as to communicate with the waste water chamber." In place of forming the air tube with two openings for the admission of air thereto" as described in No. 3059, A.D. 1864, forming "a long opening from the bottom of the dividing plate to the level of the overflow passage."

[Printed, 1s. Drawings.]

A.D. 1865, November 14.—N° 2934.

MALLET, JULES THEODORE ANATOLE.—"A new or improved process for the manufacture of oxygen." This consists in preparing oxygen by means of the decomposition by heat of the oxychloride of copper and other like oxychlorides, the solid residue in the operation being transformed anew into oxychloride by the action of atmospheric air." The "oxychloride of copper CuClCuO ," is "obtained by various chemical means," either by making a mixture in equivalent proportions of chloride CuCl and protoxide of copper CuO , or in treating the oxychloride known by the name of Brunswick green CuCl^2CuO , with a sufficient proportion of hydrochloric acid to bring it back to the composition CuClCuO , or lastly, by adding to the Brunswick green two equivalents of chloride CuCl (oxide CuO ?). Also taking "protochloride Cu^2Cl obtained by known chemical processes and by exposing it to the oxygen of the air" obtaining the oxychloride required." "The primary material obtained is mixed with from 25 to 30 per cent. of its weight of an inert material, such as sand, pulverized fire-brick, calcined sulphate of lime, or kaolin to prevent the said material undergoing an igneous fusion." The mixture "is heated to a dark red in vessels of any form, preferably of fire-clay, and more or less resembling gas retorts." If the proportion of inert material is diminished or a higher temperature employed "the retorts should be lined with a material proof against the action of the mate-

“rial under treatment.” “Compositions with a base of borate, silicate, or phosphate of copper” are not acted upon by the chloride of copper. The oxygen evolved is passed through a washing vessel which detains the steam and any chloride of copper which may have passed out.” The residue is revived by exposure to the air, and partially so by passing a current of air through the material after it has cooled in the retort.

[Printed, 4d. No Drawings.]

A.D. 1865, November 14.—N^o 2935.

GILL, SAMUEL LAWRENCE.—(*Provisional protection only.*)—“Improvements in gas stoves.” These are constructing gas stoves as follows:—Two vertical cylinders are placed one within the other, the inner one is closed at the top, and from its sides small tubes pass through the outer cylinder. Around the (exterior of the) inner cylinder, “and near its lower end, is placed a ring of gas burners, by which these small tubes become heated, and as they are arranged to incline upwards the air within them as it becomes heated ascends and escapes at the outer ends of the tubes into the room or building to be heated, whilst a current of fresh air either from the room or building or from the outer atmosphere enters the lower open end of the inner cylinder to take the place of the heated air which is passing away. The outer cylinder is open at its lower end, and from its upper end there is a pipe or flue leading to the outer atmosphere” to convey away the products of combustion from the gas burners. “In place of the air to be heated entering the stove through the lower end of the inner cylinder, the stove may be arranged in such manner that air shall pass from the exterior of the outer cylinder through small tubes into the inner cylinder, and pass away from the top of this cylinder through other tubes again into the outer atmosphere.”

[Printed, 4d. No Drawings.]

A.D. 1865, November 17.—N^o 2965.

HARBERT, JAMES.—“Improvements in the production or manufacture of gas for heating or illuminating, and in the retorts and apparatus employed in such manufacture.” These are, first, in making gas, by preference, three descriptions of gas are made in separate retorts, as follows:—1st, “equal quantities

" or thereabouts of lime and soda or other cheap alkali " are mixed with water to " the consistency of thick whitewash " and " run " into pans, by preference of cast iron, which are then placed in " ordinary gas retorts (or in such retorts as will be herein-after " described), raised and retained at a red heat for about two " hours," or until the gas is evolved from the mixture; 2nd, ordinary gas tar or other tar or pine or other cheap oil, such as petroleum or mineral oil are mixed together in the proportion of one gallon of the former to one pint of the latter. This mixture in a tank placed above the retorts is supplied to the retorts by a pipe from same " in suitable quantities from time to time as " required for conversion into gas." 3rd, " A mixture of lime " taken from the purifiers, and a strong solution of soda or other " alkali, in the proportion of about two pecks of lime to about " one quart of the strong alkaline solution. These materials are " deposited in pans which are placed in the retorts and retained at " a red heat until the whole of the gas is driven over. The " several gases thus produced are conducted from their several " retorts into an hydraulic main common to all the retorts, " ordinary coal gas being also conducted into the same main, " where the several gases mingle together in about equal proportions, the quantity of common gas being, by preference, " in excess of either of the other gases."

Second, in retorts and condensers. Retorts are formed " of a " flat oval section " and " put together in two longitudinal parts or " halves," and have transverse supports " cast or formed thereon " at suitable distances apart to support and prevent the central " part of the retort from sinking or giving way when highly " heated," or the supports " may be cast separately either in one " or in separate parts," or " they may be moulded from and " made of fire-clay if desired." The two halves of the retorts " are formed by preference, one with a rib and the other with a " groove along the edges " which come together so as to fit, and " thus form a joint to connect the two parts," straps and bands of wrought iron being bolted or otherwise fastened thereon " to " secure the two parts together." " In order to prevent the " explosion of retorts when drawing the charge the back end is " furnished with a pipe " and stop-cock or cap " and the gas is " burnt by opening the cock or by removing the cap, and then " applying a light before the end of the retort is removed." The gas from the hydraulic main is conducted into a condenser which,

in preference, is a long tank or vessel formed with a series of transverse chambers or compartments, "into and through which the " gas is conducted by inlet and outlet pipes " from " one chamber " to another in succession until it has passed through the whole " series." These chambers are surrounded with water flowing gently. " Currents of air may be substituted for the water or " employed in combination therewith."

[Printed, 1s. 8d. Drawings.]

A.D. 1865, November 18.—N^o 2972.

WILKINS, FREDERICK. — "Improvements in apparatus for " the production of hydrocarbon or other vapours, parts of which " apparatus are also applicable to measuring gaseous or fluid " matter." These are, applying "to the inside of each compartment of the drum or cylinder of ordinary wet gas meters or " other like apparatus, horsehair, cocoa fibre, sponge, or other " fibrous, porous, or textile material," and charging " the drum " with volatile hydrocarbon liquid, with or without a portion of " water or other fluid," and causing it "to revolve by weights, " springs, or other motive power applied to the axis thereof, " causing a current of air or gas to pass through or between " these substances. Also covering the drum or parts thereof containing the same with flannel, linen, &c, for the like purpose, also rendering the drum rough, or embossed, or applying to its surface needles or teeth, cement, or sand, for the like purpose. " The efficacy of the apparatus may be further increased by adding " lifting cups or floats similar to those of an overshot water wheel " but moving in a contrary direction to that of the water wheel." Also subdividing the drum "into a great number of narrow " archimedian or tubular chambers instead of only four;" in " this state it may be used as a gas meter or for a blowing apparatus when actuated by a motive power, under which circumstance an ordinary index may be attached to the drum." The chambers or tubes are filled with fibre, &c., as above. Applying to the axis of either of the drums a sealed air chamber to reduce the friction at the axle. This air chamber is applicable to ordinary gas and water meters. Employing a long pipe or tube coiled up or otherwise in which are several helices of similar lengths or other form of wire, &c., covered with a textile, &c. material, so as to absorb the liquid placed in the outer tube, a current of air or gas

being passed through the pipe by any suitable means "becomes available for lighting or other useful purposes." Reference is made to No. 2510, A.D. 1864.

[Printed, 4d. No Drawings.]

A.D. 1865, November 21.—N^o 2990.

BENNETT, SAMUEL.—"Improvements in cocks for steam, water, air, and gases at high pressures, and also in gauge cocks and water gauges for boilers, and sediment tubes for cocks and pipes." These are, in reference to this subject, as follows:—In "high-pressure gas cocks having the ordinary solid bottoms," making two or more separate and distinct passages through the plug of each cock, and placing between the passages a rib or body of metal for connecting the sides of the plug together," placing in each barrel above the plug an adjusting screw for keeping the plug down upon its bearing in the barrel above this adjusting screw, turning down the metal and forming a screw of smaller diameter and coarser pitch, or greater angle than the adjusting screw, and on this screw screwing a lock nut "which enters a recess in the top of the barrel, and the tops of the lock, nut, and barrel are level when the nut is screwed up." On the top of the outside of the barrel placing a chamber or safety cap and screwing or bolting it to the barrel, so that the under surface of the chamber shall press on the top of the lock nut and the top of the barrel, and thus prevent the lock nut from moving, making "so perfect a joint that no escape can take place from the plug, the stem of the plug being made tight by means of an ordinary stuffing box;" and also "the combination of the chamber or safety cap with an adjusting screw and lock nut." The remainder of the Specification refers to gauge cocks for boilers, water gauges, and "sediment tubes or sockets, and their combination with water gauges," &c.

[Printed, 1s. 4d. Drawings.]

A.D. 1865, November 22.—N^o 2998.

WELLS, WILLIAM, and MARLAND, SAMUEL.—(*Provisional protection only.*)—"Improvements in apparatus for obtaining artificial light from volatile liquids or fluids." These are, employing a vessel to contain a supply of a volatile liquid or fluid; "this vessel is connected by a pipe with a tap to another vessel

“ containing sponges, or other fibrous or porous substances, which
“ are kept saturated with the volatile liquid.” It is preferred to
hold the fibrous or porous substances down by wire netting or
perforated plates. “The top of this last-mentioned vessel is
“ furnished with a pipe to admit atmospheric air, and with an
“ outlet pipe connected to the burners. This vessel is placed in
“ an outer vessel which is heated by a pipe in communication with
“ the flue or chimney of the dwelling house or other establishment
“ to be lighted (or the heat may be obtained in any other con-
“ venient manner), in order that the volatile liquid may more
“ freely give off its inflammable gases, and these gases, when com-
“ bined with the atmospheric air, produce a brilliant illuminating
“ gas equal in power to coal gas,” which is “conveyed in air pipes
“ to the burners.”

[Printed, 4d. No Drawings.]

A.D. 1865, December 2.—N^o 3089.

JOHNSTON, WILLIAM.—“Improvements in lamps, lanterns,
“ and gas fittings.” These have for their object “ornamental
“ effect, economy, in manufacture, and facility of removing of
“ parts for repairing or cleaning.” One modification “relates to
“ lamps or lanterns of a well-known cylindrical form; the glass
“ cylinder is placed between two metal bands or rings, which are
“ furnished with small thin pieces of metal projected inwards;
“ between these projections the cylinder is held at top and
“ bottom.” In the description of the lamp or lanterns these
bands or rings are designated “as the ‘upper’ and ‘lower’
“ frames and described as of metal, but may be made of wood,
“ papier mache, or other suitable material.” “The lower frame
“ may be altogether dispensed with by using a bottom pane of
“ larger diameter than the base of the cylinder, which may be kept
“ in place by a groove projecting part on, or studs fitted into said
“ bottom pane. In a similar manner the upper frame may be
“ dispensed with by using a top glass dome or part with projec-
“ tion of greater diameter than upper part of cylinder.” While
lanterns are described “with a central rod, there may be used two
“ or more rods attached to top and bottom fittings and one or
“ more burners,” but it is preferred to have “one central rod
“ with a gas burner on each side so as to prevent lateral shadow.”

Another modification relates to globe lights with aperture at

lower end for convenience of lighting. The centre rod has its lower and radial projections, which rest upon the inner surface of the glass at its lower aperture; under this aperture is placed a ring or piece of metal of greater diameter than the said aperture, &c. These arrangements are "equally applicable to lanterns or " other shapes, or with panes of glass having a central aperture."

In sliding lamps dispensing "with pulley wheels, and instead " thereof" applying "to lamp rods pieces of metal, wood, glass, " ceramic ware, or other rigid or firm material over the curved " surface of which" is passed "the balance weight, cord, or " chain guided by grooves, ledges, pins, or other suitable appli- " ances." Making balance weights of glass and various other substances in various ways and ornamenting them.

"In the main ornamental body of chandeliers where glass " dishes have been extensively used" in various ways, it is proposed to use flint or transparent white or coloured glass dishes cut or engraved internally" and otherwise ornamented. They may be also made of vulcanite and variously moulded and ornamented.

In glass shades for gas burners "dispensing with the ordinary " moons and gas holders." Making "the shades wide at the " upper part where the flame is and taper thence to a narrow " shank or stem, with a hole through just sufficient to allow it " to be slipped over a slender gas tube with a burner, slipped " upon or screwed upon its summit." Air is supplied "to the " burner by means of slits, cuts, perforations, or openings in the " shade or the stem thereof." "These shades may be held fair " in position externally in various ways."

[Printed, 1s. Drawing.]

A.D. 1865, December 8.—N^o 3153.

DE MONDÉSIR, PIARRON, LEHAITRE, PAUL, and JUL- LIENNE, AUGUSTIN.—"An improved mode of applying the " compression of air for ventilating purpose, and the compression " of any gas for hurrying along elastic fluids in conveying pipes." This consists, in reference to this subject, in hurrying or driving along " lighting gas in the conveying pipes by means of a jet or " stream of compressed gas, either to replace wholly or in part " the forcing power of gasometers or gasholders, or in lieu of the " extracting or compressing apparatuses in actual use to force the

" gas as it evolves from the retorts through the purifying, washing and other apparatuses used in producing it." A reservoir of compressed gas is placed above the conveying pipe, and from the bottom of this reservoir is a small pipe passing into the conveying pipe the point of which is formed into a jet; this small pipe is straight or bent in any direction required, or it may branch off in different directions. On the small pipe, a little below the reservoir, is a tap for controlling the flow of gas. Besides the above application, this apparatus may be applied to "ventilation in general," "compressed air" being used in place of "the gas for purifying purposes, or expelling smoke, dust, or any unhealthy gas" from rooms, &c. and "for increasing the draught of chimneys and the blast (or combustible) power of blowing machines."

[Printed, *Sd.* Drawing.]

A.D. 1865, December 18.—N^o 3268.

PLANCK, HENRY.—"Improvements in apparatus for regulating heat obtained by the combustion of gas." These are, as follows:—To the vessel, &c. the temperature of which has to be regulated, fixing a vessel containing mercury, to which "is attached a tube formed conical at the top, into which cone is fitted a plug having its lower part formed as a diaphragm. To the upper part of the tube gas pipes are attached at both sides, the passages of the pipes corresponding with the upper part of the diaphragm." The delicacy of the instrument "depends upon the proportion between the capacity of the vessel containing the mercury, and the diameter of the tube in which it rises and falls, and the addition or subtraction of mercury causes a corresponding increase or decrease in the temperature at which the regulator acts, or by means of a plug attached to a screw the position of the mercury in the tube may be regulated, and the same result obtained as by the increase or decrease of mercury."

[Printed, *Sd.* Drawing.]

A.D. 1865, December 20.—N^o 3296.

WATSON, JOHN, and PLAYER, JOHN.—(*Provisional protection only.*)—"Improvements in obtaining oil and other products from bituminous shale." These are, as follows:—"The shale

“ to be operated on is placed in a suitably constructed chamber, “ kiln, or furnace,” in preference, “ of a form similar to that of a “ blast furnace; the exterior is best constructed of sheet iron and “ an interior lining of fire-bricks or of other suitable materials. “ The lower part of this chamber is provided with openings by “ which the shale after the oil has been exhausted can be removed, “ and also other openings by which air or gases may be intro- “ duced. The upper part of the chamber is provided with a “ suitable opening or openings through which the shale to be “ operated on can be introduced through double locks or valves, as “ is well understood.” “ In those cases where the shale requires “ fuel to cause it to burn, the requisite quantity is fed into the “ chamber mixed with the shale.” The volatile products escape by a pipe through the upper part of the chamber, “ a partial vacuum “ being formed by means of a steam jet, exhausting cylinder or “ fan, or any other suitable means.” The products after passing the exhauster pass through “ a series of metal pipes or other “ suitable condenser, and the greater part deposited in a fluid “ state, the uncondensable gaseous products are allowed to escape “ from the condensers, and are used as may be required either “ for heating the shale in the chamber or other vessels, or for “ rectifying the fluid products obtained.”

[Printed, 4*l*. No Drawings.]

A.D. 1865, December 21.—N^o 3303.

DAVIES, GEORGE.—(*A communication from James Stratton.*)—

“ An improved gas burner.” This consists of a hollow conical projection having one or more openings in the side, a cap having “ corresponding openings (also in the side), and a tip having in “ the top the usual aperture or apertures for the egress of the gas “ according to the form of jet required.” “ The base of the “ hollow projection is provided with an internal screw thread on “ the upper end of the supply pipe. On the upper conical or “ taper part of the former is fitted a tap closed at the top and “ having a hole or holes in the side corresponding with the open- “ ing or openings in the conical projection, so that when this cap “ is in one position the gas passes freely through the opening or “ openings and a full supply is allowed to pass through; but upon “ turning round this cap the opening or openings is or are par- “ tially closed, and thus the supply of gas is diminished. The top

“ which forms the jet passes over and encloses both the hollow projection and the cap, and is provided at its base with an internal screw thread adapted to an external screw thread on the former, and this tip is secured so firmly in its place as to require considerable exertion and the employment of a suitable instrument to remove it, the adjustment of the cap by unauthorized persons being thus rendered a matter of some difficulty.” It will be evident that by this arrangement “ the quantity of gas to be passed through the burner may be regulated with the greatest nicety, and the wasting of gas by servants,” &c. “ will be thus obviated.”

[Printed, 6d. Drawing.]

A.D. 1865, December 28.—N^o 3355.

GARDINER, EDWARD VINCENT, ISRAEL, LOUIS ASH, and ISRAEL, HENRY ASH, junior.—“ Improvements in compounds for deodorizing and disinfecting.” These are, the combination of the substances named for the preparation of a compound for the above purposes and for purifying gases; and first, the preparation of a solid, taking 150 parts of crystalized sulphate of zinc or “ some suitable compound of zinc or alumina, or a combination of these, and mixing them carefully with 50 parts of powdered hydrate of lime or other alkaline compound, watering the mixture with 10 parts of a saturated solution of sulphate of zinc or of the mixed salts. If the crystals of the zinc salts are moist this watering is unnecessary. This compound is next saturated with chlorine gas in any convenient way. If the compound is not saturated with chlorine as mentioned, it is then intimately mixed with 30 parts of bleaching powder or some other suitable hypochlorite, and this constitutes the solid disinfectant.” The above proportions may be varied; when “ acting upon gaseous bodies it is desirable to increase the proportion of hypochlorite formed by the action of chlorine or otherwise.”

Second, preparing a fluid disinfectant, &c. by dissolving “ a salt or oxide of zinc or alumina, or a combination of these,” in “ some caustic alkaline solution or some alkaline compound which shall free the oxide or oxides contained, and then redissolve them and this to saturation.” This solution is “ saturated with gaseous chlorine, or in place of this it is mixed with $\frac{1}{10}$ its

“ bulk of a concentrated solution of hypochlorate of soda or any suitable hypochlorite.”

[Printed, 4d. No Drawings.]

1866.

A.D. 1866, January 2.—N° 15.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Edmond Robin and Henri Robin.*)—(*Provisional protection only.*)—

“ An improved extensible apparatus for the passage of gases and fluids especially adapted for gasaliers.” This “ consists of two cylinders connected by caoutchouc or elastic tube, and free to slide one outside the other; the outer cylinder is also free to turn upon the inner cylinder, and carries two buttons which take into notches formed at different heights in two vertical parallel plates or bands fixed to the outside of the apparatus. The inner cylinder is screwed at the top to a fixed collar threaded in the inside to receive the gas branch pipe. The central space of this collar is prolonged downwards inside the inner cylinder by a tube, in which the upper end of a caoutchouc or elastic tube is fitted. The outer cylinder is screwed at the bottom to a movable collar threaded in the inside to receive the connection of the arms of the gasalier; the central space of this collar is prolonged upwards by a tube on which the lower end of the elastic tube is fitted. Two vertical bands or plates are fixed by screws at their upper end to the fixed collar, and at their lower end to a ring which embraces the outer cylinder. These plates are formed with notches at different heights to receive two buttons which are adjusted in holes to the outer cylinder. When it is required to lengthen the apparatus draw down the outer cylinder, the buttons during this movement passing between the two plates; as soon as the apparatus is lowered to the point required, give a turn to the outer cylinder, and with it to the buttons, and cause the buttons to enter into the notches formed at that point in the vertical plates whereby the apparatus is securely held.”

[Printed, 4d. No Drawings.]

A.D. 1866, January 3.—N° 23.

STARBUCK, GEORGE, and SELLARS, JOHN CARRINGTON.—(*Provisional protection not allowed.*)—"Improvements in cement " for making good the joints in oil stills and retorts, and joints " exposed to medium or high temperatures." These are for stills, and gas, and other retorts, making a cement consisting " of " any compound chemical or simple, or any admixture of any " mineral substance or substances as the salt or oxide (whether " artificially made or occurring as natural products) of iron, " carbon, magnesia, lime, strontia, baryta, soda, potash, alumina, " chromium, sand, or zinc, combined with silicate of ammonia, " silicate of soda, or silicate of potash, or any mixture of them in " a dry or liquid state, but it is preferred to use the compound or " mixture made in the form of a paste (requiring the aid of heat " when in the joint to cause it to harden.)"

[Printed, 4d. No Drawings.]

A.D. 1866, January 10.—N° 85.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Charles Raphael Maréchal and Cyprien Marie Tessie du Motay.*)—"An improved method of producing oxygen." It is stated that manganates, permanganates, ferrates, and chromates of potassa, soda, and baryta, and "in general all metallic oxides or acids " which will form with potassa, soda, and baryta binary combinations capable of superoxidizing, possess the property of yielding their oxygen at a more or less elevated temperature when they are submitted to the action of a current of steam. These bodies thus deoxidized also possess the property of becoming re-oxidized when they are exposed to the action of a current of air at a temperature more or less great." This invention consists " in the direct production of oxygen by means of atmospheric " gas," and "is based upon the double property just cited." One of the above binary compounds is placed in a retort or distillatory vessel, whether at its minimum or maximum state of oxidation; if it is at its minimum it is superoxidized by means of a current of air drawn or impelled over it. If the compound is at its maximum state of oxidation it is deoxidized "by means of a " current of steam, or by injecting water; the oxygen and steam " on issuing from the retort pass together into a condenser; the " steam is condensed, and the oxygen passes on to a gas holder,

" in which it is collected. When all the utilizable oxygen contained in the binary compound has been disengaged by the action of the steam, the operation of superoxidation by means of air is recommenced, and vice versâ."

[Printed, 4d. No Drawings.]

A.D. 1866, January 11.—N° 91.

BATCHELOR, PERCIVAL ASHTON, and REDDAIL, FREDERICK.—(*Provisional protection only.*)—"Improvements in the construction, arrangement, and application of retorts and settings in combination with machinery or apparatus for the manufacture of coal or other gases." These are, employing and adapting "one, two, or more retorts of a cylindrical form, composed of steel or other suitable material calculated to bear a high degree of heat, and made to revolve or rotate at any desired speed." The retorts are so arranged "as to admit of being elevated to a suitable angle or inclination" in which they are charged at the upper mouth and then "lowered and secured, and on rotary motion being imparted" then "exposed to the action of the heat from the furnace. When it is required to withdraw or empty the exhausted charge" the retort is again elevated as before, and the lid or cover at the lower end removed, the contents will be immediately discharged, thus effecting a saving of labour, time, &c., "including that of painful labour." In elevating the retorts, "the heat from the furnace or furnaces is shut off until they are again in position."

[Printed, 4d. No Drawings.]

A.D. 1866, January 13.—N° 110.

THOMPSON, JOHN CALVIN.—"Improvements in means or apparatus employed in the combustion of gas in gas stoves, and burners employed in heating and cooking." These are, employing "a chamber, into the interior of which gas is admitted from a jet or jets, and becomes mixed therein with atmospheric air; this mixing chamber consists of an inner and outer tube forming an annular chamber, the top of which is covered with a ring of finely perforated metal or wire gauze, on the upper surface of which the mixture of gas and atmospheric air is burnt. The bottom of this annular mixing chamber is closed with a plate of metal having suitable apertures therein for the

“ purpose of admitting atmospheric air to the annular chamber
“ to become mixed with the gas therein. This chamber is placed
“ at the lower part of a suitably formed case or cylinder of sheet
“ iron or other suitable material, in which is fixed a conical tube
“ the lower and larger end of which fits within, and is fixed to
“ the outer case or cylinder a short distance above the mixing
“ chamber. To the interior of this conical tube, and at the upper
“ or smaller end thereof is fixed another conical tube, the lower
“ and smaller end of which descends a short distance below the
“ surface of the wire gauze or perforated metal, above which the
“ mixture of gas and atmospheric air is burnt.”

“ In applying this invention to the ordinary gas burners, employing
“ a mixing chamber closed at the lower end by means of
“ finely perforated metal or wire gauze, in the centre of which is
“ fixed a conical tube, the upper and smaller end thereof coming
“ just below the top of the chamber, which is also covered with
“ finely perforated metal or wire gauze. This mixing chamber is
“ placed over any suitable burner.” The mixture of gas and air
is burnt on the upper surface of the wire gauze or perforated
metal, the centre of which is protected from too great heat by a
metal plate.

[Printed, 8d. Drawing.]

A.D. 1866, January 15.—No 133.

WHITE, GEORGE.—(*A communication from Ferdinand Kùp.*)—
(*Provisional protection only.*)—“ Improvements in gas burners.”
These are “ for regulating the illuminating effect of either bats-
“ wing, fish-tail, argand, or other similar gas burners, by regu-
“ lating exactly the quantity of atmospheric air to the gas flame.”
For this purpose the burner is provided on the outside with a
moveable jacket, socket, casing, or cap having one or more
openings through which either the gas flame or the entire top or
part of the top of the burner may be caused to protrude, pro-
vision being made for allowing the setting of the said jacket
socket, tube, casing, or cap at any required height, and thus allow
more or less air to be admitted to the flame.” By preference a
male screw thread is cut in the outside of the burner, which screw
enters into a corresponding female screw thread provided in the
inside of the jacket; “ or this latter may be arranged in such
“ manner as to allow of its gliding gently over the smooth outer

" surface of the burner, or any other suitable mechanical arrangement may be resorted to that allows of regulating at will the position of the opening or openings of the jacket" in " respect to that of the slit or slits, hole or holes, or other opening of the burner through which the gas takes its exit."

[Printed, 4d. No Drawings.]

A.D. 1866, January 20.—N° 185.

BÜNGER, WILLIAM.—(*A communication from Julius Brönnner.*)—(*Provisional protection only.*)—"Improvements in gas burners." These are, as follows:—"The lower part of the burner passes into the gas pipe, and is by preference of similar form to an ordinary gas burner placed in an inverted position within the supply pipe. The gas passes through the internal orifice to the other or outer part of the burner, which is of the usual construction, but is formed with a larger orifice than the inner one. By passing through the internal orifice the pressure of the gas is reduced before it reaches the flame or point of combustion, and when a very steady flame is required the chamber between the inner and outer orifices of the gas burner is fitted with an intercepting layer of cotton, asbestos, metal fillings, wire gauze, or other similar materials," causing "a more perfect combustion of the gas, which is thus prevented from combining with too large a volume of atmospheric air, only a sufficient quantity of which is brought in contact with the gas to develop its highest illuminating capacity."

[Printed, 4d. No Drawings.]

A.D. 1866, January 27.—N° 274.

POCOCK, WILLIAM WILLMER.—"Improvements in gas meters." These are, "inside an outer cylinder or case, closed at all parts except to inlet and outlet pipes," fitting "another concentric cylinder, so that a space is left between the two cylinders; the inner cylinder is soldered or connected at the bottom to the end of the outer cylinder, while its upper end which reaches to about the middle of the height of the outer cylinder is open." Liquid is admitted into the space between the cylinders. "Over the inner cylinder and within the outer cylinder is a third cylinder acting as a piston; it is of larger diameter than the inner cylinder; it is closed at the top and

“ open at the bottom, and is free to move up and down in the
“ space before-mentioned. The space between the top of this
“ third cylinder and the outer cylinder forms one gas chamber,
“ while the space within and below the third cylinder forms a
“ second gas chamber, the two chambers being hermetically
“ sealed from each other by the liquid in the liquid space. The
“ gas is allowed to enter into each of these chambers alternately,
“ and its pressure causes the movable cylinder alternately to rise
“ and fall, the gas contained in the chambers being alternately
“ supplied to the pipes. The number of up-and-down motions
“ of the movable cylinder is registered, and the quantity of gas
“ passed through the meter can therefore be ascertained. The
“ movable cylinder has connected thereto a cord or string
“ passing through the top of the outer cylinder and over one or
“ more wheels to a counterweight, to one of which wheels the
“ registering apparatus may be connected.” To prevent escape
of gas through the aperture in the outer cylinder through which
this cord passes, carrying “ a tube down from this aperture into
“ another tube in the moveable cylinder containing liquid to
“ form a liquid seal. Instead of cylinders any other convenient
“ shaped cases may be employed, The meter is fitted with any
“ suitable arrangement for admitting the gas alternately into the
“ two chambers.”

[Printed, 1s. Drawings.]

A.D. 1866, February 3.—No 346.

WILLINGTON, THEOPHILUS ALFRED GILBERT.—“ Improve-
“ ments in apparatus for heating conservatories, apartments, or
“ boilers by means of gas.” These are, employing two or more
“ heating chambers or stoves, which are internally heated by gas
“ jets, and connected together by a heating pipe or tube con-
“ ducted round the place which is required to be heated. One
“ of the chambers is larger than the other, and heated with a
“ greater number of gas jets; this may be termed the inlet
“ heating chamber, connected by an inlet pipe with the open air.
“ To this chamber is attached one end of the heating pipe or
“ tube, and at or near the other end of the heating pipe is fixed
“ a second and smaller heating chamber or stove in which are a
“ smaller number of gas jets, called the outlet heating chamber,
“ as it is connected with the open air by an outlet pipe.” “To

"insure a constantly active circulation of the heated air the inlet pipe may be laid in or near the floor of the place to be heated, and the outlet pipe may be fixed in or near the roof." "When requisite in the case of a very long range of heating pipes or tubes, one or more intermediate heating chambers may be used; they should be so placed, and contain such a number of jets, that the current of air which may have given off its heat during transmission receives additional heat from the intermediate heating chamber, and is always urged in one direction."

[Printed, 10d. Drawing.]

A.D. 1866, February 10.—N^o 416.

SHEDLOCK, JAMES JOHN.—"Improvements in gas burners." These are as follows:—"An inner chamber is provided, one end of which is closed by a cap, the other end is left open, forming the inlet for the gas." The gas enters the inner chamber and passes out through a hole or holes into an outer chamber. The aperture through which the gas passes to be consumed is regulated by the outer chamber being made to rise or fall on the inner chamber by means of a screw on the interior of the outer chamber, and a corresponding screw on the exterior of the inner chamber or otherwise. "The section of the chambers may be of any form, provided that the interior of the outer chamber shall correspond in form with the exterior of the inner chamber. The form of the flame will of course take the same form as the section of the chambers." When it is required for cooking purposes, "holes or apertures are made in the bottom part of the outer chamber, over which is fitted a ring having holes or apertures corresponding with the holes or apertures in the outer chamber. This ring can be made to slide on the outer chamber." In using "bats-wing" and "fish-tail" burners to obtain a maximum of light with a minimum of gas, a chamber is provided having a partition with one or more holes or apertures fitted in the interior. The cap on the upper end has holes or apertures from which the gas passes to the flame, or it may be that one or more common nibs or burners are screwed into the upper part of the chamber. Also using a single burner having a plate fitted in the interior, in which is made a taper hole to supply the required quantity of gas to the burner; or a common

burner or nib may be screwed into a body in the interior of which a burner of smaller capacity is fitted.

[Printed, 4d. No Drawings.]

A.D. 1866, February 13.—N° 444.

LEVERSON, MONTAGUE RICHARD.—(*A communication from Guillaume Lemaire Mulherbe.*)—(*Provisional protection only.*)—

“Improvements in the manufacture of gas suitable to be used for illumination, or for obtaining heat or motive power.” These are, employing a vessel in which there are a number of shelves supporting wicks or like absorbent materials, and pouring a hydrocarbon in “at the top of the vessel on to the upper shelf, which it fills until it runs off by an overflow on to the second shelf, from which it overflows to the third shelf, and so it supplies all the shelves whatever the number employed.” This vessel is immersed in tepid water, kept so by a gas flame. Air is caused to pass over the wicks or materials on the shelves by machinery, when it becomes inflammable, and is conveyed to the burners by a pipe or pipes. The amount of hydrocarbon is regulated by the amount of air passing to the vessel, or by the size of the flame which heats the water cistern.

[Printed, 4d. No Drawings.]

A.D. 1866, February 13.—N° 447.

MARLAND, SAMUEL, SMITH, WILLIAM HORATIO, and WELLS, WILLIAM.—(*Provisional protection only.*)—“Improve-

ments in obtaining and applying artificial heat for producing light and for other purposes, and in the apparatus employed therein.” These are obtaining the requisite heat for producing artificial light and other purposes by means of “chemical agents instead of by steam or by heated products of combustion, for the purpose of causing atmospheric air to combine with the inflammable vapour given off by distilled petroleum or other suitable volatile liquids, as in such process it is essential to apply a moderate degree of heat to the vessel containing the volatile liquid.” “Sulphuric acid and water combined in different proportions according to the temperature to be attained give a good result, but other acids and chemical agents may be found to answer the purpose. The apparatus when applied for illuminating purposes, and when sulphuric acid is the chemical

" agent employed, consists of two conical or other vessels, one
 " containing the sulphuric acid and the other water, these vessels
 " are in communication with a third vessel by india-rubber or
 " other flexible pipes, each provided with a screw or other
 " equivalent for compressing the pipe and so contracting the
 " orifice so as to be able to vary the relative proportion of
 " sulphuric acid and water that is allowed to drop into the third
 " vessel which is in communication by a pipe with a fourth vessel
 " containing the vessel with the volatile liquid to be heated."
 " The mode of combining the atmospheric air with volatilized
 " liquid " is described in No. 2998, A.D. 1865, or " in any other
 " suitable manner." This mode of obtaining artificial heat " is
 " applicable in many chemical and analytical purposes in which
 " danger arises from the presence of fire, also for other purposes
 " where a moderate heat is required."

[Printed, 4d. No Drawings.]

A.D. 1866, February 16.—N° 497.

CLAY, WILLIAM.—(*Provisional protection only.*)—" Improve-
 " ments in economizing the heat of gas producers." These are,
 " to economise the heat given off by the gas producers used in
 " producing the gaseous fuel for ' Siemens ' regenerative furnaces
 " described " in Nos. 2861, A.D. 1857, 167, A.D. 1861, 972, A.D.
 " 1864, and 3018, A.D. 1864. Hitherto these " have been built of
 " brick in the form of single or double kilns, and all the heat gene-
 " rated within the kilns in effecting the distillation of the coal
 " has been lost in radiation." In order to utilize this heat it is
 " proposed " to form the double or single kiln of iron with a water
 " tight jacket all round and at the top thereof." It is preferred
 " to make the fire-bars " tubular and connect them with the water
 " spaces at the opposite sides of the kiln." In the top of the
 " water space is formed a steam chamber and the steam is led from
 " it to wherever it may be required. " The hoppers in the top of
 " the kiln pass through the water space, and the pipe for leading
 " off the gas generated in the kiln may, if thought desirable, have
 " a water jacket extending upwards to any required distance."

[Printed, 4d. No Drawings.]

A.D. 1866, February 16.—N° 498.

WELCH, EDWARD JOHN COWLING.—" Improved apparatus for
 " carburetting air and gas." This consists as follows:—The

upper part of the apparatus is a tank for the liquid in the bottom of which "is a valve opening upwards, but held down by a spring and forced open when required by a rod acting on a lever by the cap or plug (which stops up the filling hole) being screwed down so that when the cap or plug is removed, as when filling the reservoir, the valve is closed. From the under side of the valve, seat a cone or tube dips into a small tin box open at the top and which holds a sufficient quantity of the liquid to seal the end of the tube and prevent air passing up. From this box the liquid flows into the trays. The carburetter consists of a number of shallow trays, each holding a small quantity of the liquid at the bottom, and if any more comes into it the surplus passes on to the next tray below." These trays are filled with some porous material such as "cotton thread, which is threaded up and down through perforated tins placed about two inches apart. In the centre of the trays there is an inner chamber which is made of tin or other metal perforated to within about half an inch of the top. The outer rim or sides of the tray has holes perforated all round it. In some of the trays the air or gas passes from the outside towards the centre, but in others it passes from the centre to the outside." The short pipes in the trays stand about half an inch above the bottom of each tray in the centre. "The bottom tray of all has not the pipe." Down the centre of all a pipe passes from the top of the tank to near the bottom of the lower tray. The air or gas passes first through the lowest tray, and gradually passing upwards escapes out by a pipe which opens immediately below the bottom of the tank. Below the lower tray is a space to catch any liquid beyond the proper supply. The body of the apparatus is supplied with a jacket of warm water kept so by a small burner jet, or otherwise.

[Printed, 8 $\frac{1}{2}$. Drawing.]

A.D. 1866, February 17.—N $^{\circ}$ 513.

KIDD, JOSHUA.—"Improvements in carburetting low pressure superheated steam, air, or coal gas for lighting and heating purposes, for generating steam or hydrocarbon vapour, and in apparatus employed therein." These are, first, heating and evaporating liquid hydrocarbons "from the top of their vertical column," and there mixing them "with air, steam, or gas as

"required, in suitable vessels so arranged that the heat can be applied to the apparatus through the centre of the same and its intensity there regulated." Or drawing "up the liquid hydrocarbon by capillary attraction to the point of combustion" and there mixing it "with gas for lighting and steam for heating purposes."

Second, heating and evaporating "the liquid from the top of its vertical column" and injecting it by pressure into a heated vaporiser or retort, and thus generating steam or hydrocarbon vapour; the steam is used as a motive power, and the hydrocarbon vapour is mixed with steam in the retort and it is burned as an auxiliary fuel for heating steam boilers or for other purposes, by ejecting the mixed vapours over or upon the burning coal or coke in ordinary furnaces.

[Printed, 1s. Drawing.]

A.D. 1866, February 26.—N^o 585.

THOMAS, JAMES.—(*Provisional protection only*).—"Improve-ments in gas meter indexes." These are, making an index in front of the frame that contains the machinery or clockwork with a row of holes, "so arranged that the number of feet consumed can be seen through them and read off in one line, all the other figures being out of sight but two cyphers, which are marked or placed at the extreme right to make up the compliment without fractions of the number of feet consumed. The index is worked by means of three dials, around each of which are enamelled or marked ten figures, namely, from 1 to 10 consecutively. The first dial on the right indicates hundreds, the centre dial thousands, and the dial on the left tens of thousands." The machinery for working the dials in a frame consists of a series of notched or cogged wheels working in each other fixed on the axles of the dials, and an extra axle is placed at the extreme right of the frame. One set of wheels has one notch or cog and the other ten on their several peripheries; the one-notched wheel plays into the ten-notched wheel of the adjoining dial. To prevent the dials from being reversed a lever worked on a spindle and fitted on the upper part of the frame at the back and with a roller attached to one end is fitted and made to ride over an eccentric or snail cam fixed on the end of the right handle spindle, and which the lever stops against on an attempt being made to reverse the action of the dials, the lever being firmly kept down by a spring

fixed on the other end. "A cog wheel is fitted horizontally under
" the frame and works the machinery, having a hinged lever
" fitted on the top, and made to drop between and stop against
" the spokes of the horizontal wheel so as to prevent its being
" turned back. The cog wheel is worked by an endless screw
" fitted on the axle of the drum of the meter, and a vertical shaft
" acted on by the cog wheel works by an endless screw a pinion
" wheel fixed on the spindle at the right end of the frame, and
" sets the machinery in motion, and upon the top of the said
" vertical shaft a metal drum divided into parts on its outer edge
" revolves with the shaft, and shows by an indicator the number
" of feet that passes through the meter in a given time."

[Printed, 4d. No Drawings.]

A.D. 1866, February 28.—N^o 619.

CLARK, RICHARD.—(*Provisional protection only*).—"Improve-
" ments in signal, street, or other lamps, and in gas burners."
These are, first, in lamps employed in front or end of railway trains,
for denoting the character and course of a vessel at sea, or in lamps
used for signalling purposes, using "of clear or colored glass
" reflectors, or a colored chimney around the light," "thereby
" dispensing with the use of the lens for lamps."

Second, in gas lamps for streets, constructing "them of one
" or more pieces of glass; the side portions of glass are of a para-
" bolic form, with the apex downwards, the top is closed in, either
" with metal or glass," if the latter, in preference, it should be
silvered to form a reflector. When the entire lamp is made of
one piece of glass the glass sides and top may be formed together
in one piece, or they may be separate. In some cases silvering
the side of the lamp, employing "opal, glass, porcelain, or
" silvered glass reflectors to the lamps now in use." In some
cases making street lamps of the present form but using a
square silvered reflector within the lamp, in others employing
" silvered glass at the top of the lamp instead of the clear glass
" now used."

Third, in constructing roof lamps for carriages employing a
valve instead of the screw now used when the lamp is supplied
with oil.

Fourth, the admission of air within the outer chimney above
the point of admission of an argand flame. Employing a chimney

within the flame in combination with one around it, the internal one in some cases is opal, glass, porcelain, or silvered glass; both are made with a flange and held by fittings.

Fifth, in combination with the gas burner employing a dome of silvered glass, as well as drops or spangles of crystal glass when used as a suspension light.

[Printed, 4d. No Drawings.]

A.D. 1866, March 5.—N° 669.

CLAYTON, THOMAS.—“Improvements in apparatus employed in producing illuminating gas from inflammable and volatile liquids.” These are, first, “the system of employing and connecting two or more evaporating vessels, or one vessel divided into two compartments working alternately or successively for enabling the vessel or compartments one after the other to be put out of action when they have become unduly chilled, and put in action when they have regained the temperature of the surrounding air.” Two previous Specifications are referred to, namely, Nos. 652, A.D. 1861, and 3136, A.D. 1863, in the latter of which is a generator having any convenient number of divisions packed with sponges, &c., and supplied with liquid through a tube in each division. The air is forced through pipes into the generator by a forcing apparatus “resembling a gas meter kept in action by a wound up spring or weight or other means, there being a governor for enabling the air forcing apparatus to maintain a uniform pressure of air in the evaporating or generating vessels. A shaft or spindle from the forcing mechanism also gives motion to a train of wheels or other gearing, which after a given number of revolutions shuts off the first evaporating or generating vessel, and brings the second into operation.”

Secondly, a tap for alternately shutting off and admitting air to the two evaporating vessels, “having a plug which revolves at a slow speed by means of a worm wheel and worm communicating by shafting with the air forcing apparatus.” “The shell of the tap has three apertures with unions,” the one “communicating by a pipe with the governor of the air forcing apparatus,” and the other two connected by pipes “to the two air pipes of the evaporating vessels.”

[Printed, 10d. Drawing.]

A.D. 1866, March 8.—N° 706.

BROWN, SAMUEL SHAW.—(*Provisional protection only.*)—"Improvements in gas burners." These are, as follows:—The burners, like all others are hollow, "the openings for the escape of the gas are the same in form as the slits or union jets which produce the flames known as bats' wing and fish tail, or they are of such other form as shall, when taken singly, produce an expanded flat thin flame." Two or more of these "are placed in such proximity to each other that although the flames, which have their flat sides parallel to each other, are separate and distinct close to the openings, still at a greater or less distance therefrom as may be desired, they impinge on each other and unite to form one bright flame." More light is obtained from a given quantity of gas by burners of this kind than from ordinary burners.

[Printed, 4d. No Drawings.]

A.D. 1866, March 15.—N° 769.

McKENZIE, GEORGE.—"Improvements in obtaining illuminating gas and oil." These are, "the combining of coal and mineral oil to form a compound to be used for obtaining illuminating gas and oil," as follows, for the making of gas the coal and oil, both as free from water as possible, and the coal in powder are mixed together in the proportion of thirty gallons of oil to one ton of coal, in preference, both being in a heated state. In preference, crude shale oil or petroleum, after distilling off water and light oils, is employed, and "in some cases the residue known as 'bottoms,' obtained in treating crude shale oil in the existing processes of manufacture, and which is left in the still after distilling off the 'light' and lubricating oil, may be mixed with the crude oil" employed in this process "with the view of reducing the cost of the raw material." This gas compound "is treated for the obtainment of illuminating gas precisely like the ordinary gas coal used for that purpose." The coals employed are bituminous coals, but do not include "lignite, which is sometimes called 'brown coal,' nor the mineral anthracite."

[Printed, 4d. No Drawings.]

A.D. 1866, March 23.—N° 862.

NEWTON, WILLIAM EDWARD.—(*A communication from Doctor Deicke.*)—(*Provisional protection only.*)—"Improvements appli-

" cable to the treatment of the substances used in the purification
" of gas." These are, not only "to renovate the purifying
" material used in the manufacture of coal gas which through
" continued use has become exhausted, and which material is
" formed either by the mixture of a salt of oxide of iron with
" hydrate of lime or salt of lime, or prepared from oxide of iron
" alone (Laming's purifying mass), but to make the same far
" more effective than it was at first." This object is effected by
" the conversion of the free sulphur which it has accumulated in
" the purifying into sulphuric acid. "By the addition of metallic
" iron the purifying substance when it has become completely
" saturated with sulphur, the sulphur becomes converted into
" sulphuric acid and sulphate, which may be washed out and
" removed from the purifying material."

[Printed, 42. No Drawings.]

A.D. 1866, April 7.—N^o 1003.

DAVIES, GEORGE. — (*A communication from David Greene Haskins.*)—"Improvements in apparatus for heating houses and
" apartments." These are, heating through pipes and registers
" in floors or walls of apartments. A current of air is caused to
" pass over or through a system of radiating materials so arranged
" as to absorb, conduct, and radiate the heat imparted to the
" same from the burning gases or vapours. The smoke and
" vitiated air are carried off in a separate pipe or flue to the
" chimney or other place of exit." This principle is likewise
" applied "to the construction of stoves for heating the apartment
" in which they are placed, and also to cooking stoves." To
" heat the several apartments of a house, the apparatus is placed in
" the cellar or lower apartment of the house, as follows:—An outer
" casing of some non-conducting material (galvanized iron or tin)
" of a cylindrical or other form is supported near the floor or on
" the wall, and placed horizontally or inclined from rear to front.
" Inside and resting on the bottom of the same is a smaller com-
" partment or chamber of good conducting metal, such as sheet or
" cast iron, and much smaller than the outer one. On the under
" side of the outer casing are one or more openings fitted with short
" sections of pipe communicating with the inner chamber. At
" these openings are placed the burners of the gas or other flame,
" the flame and products of combustion pass into the inner chamber,
" which communicates by a pipe with the chimney or other exit.
" In the inner casing are one or more sheets of wire netting or

perforated metal plates. In the space between the two chambers is placed transversely a series of sheets of wire netting or other reticulated heat-conducting material, or pipes, or rods. "Another modification of the radiating devices consists of a series of elongated narrow chambers opening into the inner chamber, but closed otherwise, and projecting radially from the said chamber." In a cooking stove the oven is surrounded with an air chamber containing the interposed wire netting.

[Printed, 8d. Drawing.]

A.D. 1866, April 20.—N° 1116.

LEIGH, JOHN.—"Improvements in the purification of coal gas." These are, "the use of distilled and concentrated gas water or ammonia water, whether such ammonia water or gas water be, firstly, distilled and concentrated in its ordinary crude state, that is, as it is ordinary produced in the manufacture of coal gas; or, secondly, previously causticised by the addition of lime to the gas water, so as to remove the carbonic acid therefrom and then concentrated by distillation; or, thirdly, by treating the crude ordinary gas liquor or gas water or ammonia water with the spent lime or refuse lime of gas works, that is, lime which has been previously used for the purification of gas, so as thereby to deprive the ammonia water of a portion of its carbonic acid and impart to it a portion of its sulphur."

Fourth, "the distilled and concentrated gas water as prepared by the first method and treated by quick lime, or by the spent or refuse lime of gas work, that is, after the distillation and concentration."

Fifth, "the use of distilled and concentrated gas water, however prepared and whether causticised or sulphuretted before or after the distillation."

The liquors are injected into the ordinary scrubbers, &c. "so as to fall in showers into the current of gas," or "absorbed by sawdust, coke, pumice stone, or other dry porous material, and placed in ordinary lime or copperas purifiers" and the gas passed through them.

[Printed, 4d. No Drawings.]

A.D. 1866, April 20.—N° 1120.

HASELTINE, GEORGE.—(*A communication from James Burnum Sweet.*)—(*Provisional protection not allowed.*)—"An improved mode

“ of and means for lighting and extinguishing street and other
 “ gas lamps and burners.” This consists as follows :—“ A small
 “ clock similar to any ordinary time-piece is enclosed in a
 “ weather-proof metallic case or box ; one side of this case may
 “ be made in the form of a dial, and will serve as a time-piece ;
 “ the said box or case is placed at the bottom or other convenient
 “ part of the lamp, and the mechanism therein is connected with
 “ the stop-cock which controls the admission of gas to the burner
 “ in such a manner that it can be set to open or close the said
 “ cock at any desired time. A revolving wheel or disc carrying
 “ eight or more charges of chemical or friction matches is arranged
 “ near the orifice in the burner. This wheel is so connected with
 “ the clockwork that once in about twenty-four hours it is sud-
 “ denly moved forward one-eighth part or less of its revolution.
 “ By the movement of this wheel sufficient heat is generated,
 “ either by the friction of a match or by ejecting one charge of the
 “ chemical compound to ignite the gas escaping from the burner.
 “ The revolving wheel is so connected with the other portions of
 “ the mechanism as to turn only when the stop-cock is opened.”
 Adjustable stops are so arranged “ that the gas may be turned on
 “ at the burner and lighted either early or late in the evening and
 “ turned off either early or late in the morning.”

[Printed, 4d. No Drawings.]

A.D. 1866, April 24.—N^o 1156.

RUSSELL, GEORGE FITZJAMES, and CARBINES, WILLIAM HENRY.—“ Improvements in the manufacture of gas.” These are, “ the application for the purpose of the manufacture of gas
 “ of cocoa nut shells, cocoa nuts, or other nut shells, or nuts such
 “ as beech nuts, Brazil nuts, or others, fir cones and acorns.”
 “ with or without the contents of such shells, and in any com-
 “ bination desired,” as follows :—They are distilled in a cast-iron
 retort at the desired temperature. The gas is conducted through
 lime water or other purifying material. The retort may be com-
 posed of earthenware if preferred. After the gas is obtained from
 the materials “ the production of ammoniacal liquor commences,
 “ consisting chiefly of hydrocarbons and oils, the ultimate result
 “ being charcoal of a very superior quality.” “ The shells may
 “ either be dried before being placed in the retort, or if containing

"moisture a condenser must be used in order to withdraw the steam from the gas."

[Printed, 4d. No Drawings.]

A.D. 1866, April 24.—N^o 1157.

ABEL, CHARLES DENTON.—(*A communication from Anton Richter and Romuald Bozek.*)—(*Provisional protection only.*)—"Improvements in joints or connections for pipes." These are, "joining together the ends of pipes by means of rings or short tubes of india-rubber, &c., so formed and arranged in combination with a peculiar formation of the ends of the pipes that a water, steam, or gas tight joint is thereby produced," becoming all the more tight with "the greater internal or external pressure." In one arrangement "for forming a butt joint between two pipes having to withstand internal pressure, the ends of the pipes are recessed on their internal surfaces for a short distance, and into such two contiguous recessed ends is placed a correspondingly formed short tube of india-rubber." A still more perfect joint is made by the inner meeting edges of the pipes being "chamferred off so as when placed together to form a V groove, and a correspondingly formed V projection on the outer surface of the india-rubber tube is then made to fit into such groove. For suction pipes where the pressure is external a similar joint may be employed, the V groove being formed by the outer chamfered edges of the pipe, while the V projection is formed on the inner surface of the india-rubber tube which in this case is placed over the exterior of the joint." "In another arrangement where it is required to form the joints of sockets and spigot pipes under internal pressure, the spigot end is formed with an internal rim a little way down, which fits into the socket, and a capped india-rubber ring is placed over the spigot end so as to rest with its closed end against the said rim." "In applying this arrangement to pipes under external pressure the position of the capped ring is simply reversed." In another mode under internal pressure the ring is placed between the bolt end of the spigot and a shoulder in the socket in such a position that the cap opens into the interior of the pipe. There are other arrangements for joining together the ends of pipes by means of rings or short tubes of india-rubber or similar material so

arranged in combination with a peculiar formation of the ends of the pipes.

[Printed, 4d. No Drawings.]

A.D. 1866, April 25.—N^o 1162.

UPWARD, ALFRED, and COCHRANE, The Honourable ARTHUR AUCKLAND.—“Improvements in the manufacture of “gas.” These are, substituting for boghead, mineral, and rich cannel coal used “with coal which yields a gas of comparatively “low illuminating power,” “natural bitumens, such as are found “in Trinidad.” The natural bitumens which are employed, it is said, “differ essentially from cannel coal or other such materials “which have hitherto been used with ordinary coal in gas “making.” Natural bitumens, such as are employed, it is said, “when immersed in a solvent, say benzole, lose their form and “for the most part dissolve, which is not the case with cannel “coal and such like material.”

[Printed, 4d. No Drawings.]

A.D. 1866, April 27.—N^o 1188.

WAVISH, JAMES.—(*Provisional protection only.*)—“Certain improvements in gas lamps subject to the exposure of high winds “and uncertain draughts.” These are, “in the adaptation and “application to gas lamps of a cap to be used in connection with a “chimney” described in No. 1158, A.D. 1864, as being applicable for the combustion of volatile oils, by which means are ensured “a steady and complete combustion of the gas without any “liability of the flame being extinguished by the extent of wind. “current, or draught, or even to flicker or be slightly affected by “it.” In connection with this cap it is intended to admit “the “air for supporting combustion of the gas from the top of the “lamp.”

[Printed, 4d. No Drawings.]

A.D. 1866, May 1.—N^o 1229.

HUGHES, RICHARD HUGH.—“Improvements in or connected “with lamps and burners, and an improved apparatus for lighting lamps.” These are, first, avoiding the danger from breaking

of the glass globe and other lamps by "surrounding the glass
" with wirework, so that should the glass break, the pieces are
" prevented falling." The wirework is suspended with the glass
inside from a support composed of three or more arms hinged so
that they contract, and fall and open out.

Second, constructing and applying "in connection with burners
" of a heating chamber through which the gas is made to pass
" and by which it is heated before reaching the burner." This
chamber may be placed above the chimney "so that it is made hot
" by the products of combustion from the burner; or a channel
" may be formed round the lower part of the burner, through
" which the gas passes before reaching the burner."

Third, "making tops or covers for gas and other lamps of wire
" gauze which has been tinned or galvanized after the gauze has
" been woven," and employing "three or more pins or screws
" passed through wire gauze tops or covers for gas and other
" lamps, so as to rest upon the globe or chimney; the distance of
" such pins or screws from the centre of the top or cover being
" regulated according to the size of the globe or chimney."

Fourth, an apparatus for lighting lamps consisting of a tube
one end of which is open, while the other terminates in a small
portable gas holder, by preference, capable of expanding, and
filled with gas when expanded to its fullest capacity. The tube is
fitted with a stop-cock to stop the flow of gas when required, the
portion of the tube at the other end is curved to apply it over or
under gasaliers or it may have several branches.

[Printed, &c. Drawing.]

A.D. 1866, May 1.—N^o 1233.

DENIS, GUILLAUME CHARLES.—"An improved apparatus for
" purifying the lighting gas resulting from the distilling of coal."
This consists "of a condenser and series of columns, four in
" number, through which the gas and other volatile pro-
" ducts pass, and are cooled and condensed by water intro-
" duced into the three last columns by rose heads; this water
" falls in a spray, which is further subdivided by falling on nine
" wire diaphragms placed throughout the diaphragms," the water
being "thus pulverized, so to speak." There "is an outlet pipe for
" the escape of the gas in case it is carried down into the reser-
" voir by the plunge pipes, the gas will, on rushing to the upper
" part of the reservoir, meet with an outlet at (this ?) pipe," which

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conveys it up above the roof. There are four openings in the tank lid for cleaning purposes, provided with taps or plugs. A pipe discharges the overflow of the tank. The inlet and outlet pipes are bent, and in the first column is a "double action valve" for directing at will either upwards or downwards the manufactured gas." "This apparatus by itself alone comprises the following apparatus: it serves, 1st, to collect the tar and the water proceeding from the washing tube. 2ndly, to cool, condense, and wash the various volatile products of the distilling of coal. 3rdly, it serves as a safety valve by presenting a foreseen escape to the gas in case of an excess of pressure, which might determine a back compression."

[Printed, 1s. 4d. Drawings.]

A.D. 1866, May 2.—N^o 1239.

COHEN, DAVID.—"Improvements in dry gas meters." These relate "to that description of gas meter commonly called dry gas meter, and in which the measuring compartments are formed by means of a movable or flexible diaphragm," and consist, first, in the frame of the diaphragm; "the outer frame is doubled and liberal space is allowed above the usual frame to leave a space for soldering, so that the flexible part may not be scorched in soldering."

Second, in the flexible part of the diaphragm; "the double shields are so constructed that the inner shield is fixed to the outer one by means of grooves, which hold the flexible part firmly between them; this dispenses with the use of glue, which melts through the dampness of the gas, and at the same time gives extra strength to the edge of the material."

Third, this "improvement is on the square excentric valve, the upper part of which passes from one passage to another, uncovering long openings through which the gas passes freely from one part of the meter to the other." To the angles of the upper valves connecting "four rings which rotate round pins to guide the said upper valve in regulating the covering and uncovering of the openings. The pins are protected by glass cylinders, so that when the rings rotate round the pins they may not be deterred by them, but turn smoothly." "The cover or section valve is faced with leather or some other flexible material, so as not to wear the metal valve," and a division

or bridge is fixed across the openings so as to keep the leather faced cover in its proper position, and prevent catching.

[Printed, 10d. Drawing.]

A.D. 1866, May 10.—N^o 1338.

ORLANDO, BROTHERS.—“Improvements in governors or apparatus for regulating and controlling the pressure and flow of illuminating gas or other gaseous fluids.” These are, forming the float or gas holder with a ‘difference chamber,’ or chamber for the reception of atmospheric air, the supply and discharge of atmospheric air (as the float ascends or descends) being obtained by means of a pipe, the lower end of which is open to the atmosphere, the other end of the said pipe terminating in the difference chamber. To the inlet of the governor is connected a second pipe, communicating with a ‘gas chamber’ placed over or above a gas holder. The action of the valve and flow of gas is regulated with great nicety by the aid of the difference chamber and gas chamber.” “By raising the water line a greater inlet pressure will be required to open the valve, and a less pressure will be given on the outlet of the governor. Thus by regulating the water line any pressure on the inlet can be reduced to the pressure required on the outlet, so that when the governor is fixed, water will have to be run into it until the inlet pressure is reduced on the outlet to the pressure required at the daytime; the only attention afterwards required will be keeping the water line to its adjusted level, for when the pressure is increased at the works it will cause a greater pressure on the inlet of the governor,” which by opening the valve “will cause a corresponding increase on the outlet, and as the pressure is reduced the float or gas holder will rise, thus reducing the pressure to the point at which it was adjusted.”

[Printed, 10d. Drawing.]

A.D. 1866, May 10.—N^o 1348.

NEWTON, ALFRED VINCENT.—(*A communication from Levi Steens and Norman Carmi Munson.*)—“Improved apparatus for manufacturing illuminating gas.” This consists of a “driving shaft, which gives rotary motion through a train of gearing to a fan or blower,” and which “serves also to put in motion a chain of buckets or elevator, by which the gasoline or hydro-

"carbon oil is raised from a receiver and discharged into an elevated carburetting chamber," situated in a larger carburetting or mixing chamber set above the reservoir, and "both chambers are fitted with pierced dish-shaped spreaders, through which the gasoline percolates. The air entering the upper chamber passes upwards through the descending droppings of the gasoline, and escaping from that chamber enters the larger chamber through a trap into the second and surrounding chamber, which trap will not allow of the air passing through it. The carburetted air finds its way from the bottom of the second chamber to a delivery pipe, and the hydrocarbon not taken up by the air flows back into the elevator case."

As a modification of the above, the elevator may be mounted in the centre of the reservoir and carburetter, and the gasoline may be discharged on to a spreader formed of a helical plate, the space between the coils of the helix being filled with shavings of rattan cane or other porous material. The air is admitted from the fan or blower to the lower part of the carburetter," and is forced upwards through the passages and the porous material saturated with the hydrocarbon forms an illuminating gas. "In order to regulate the supply air to the carburetter automatically, the top of the carburetter is made free to rise and fall with the variations of the internal pressure of air. To a stud on this cover is connected one end of a rock lever which has its fulcrum on the side of the carburetter; the other end of the lever is connected with a valve which commands the air pipe leading from the fan or blower case; the rise therefore of the cover indicating undue pressure of air in the carburetter will cause the lever to partially close the valve and diminish the supply of air."

[Printed, 16*l*. Drawing.]

A.D. 1866, May 11.—N^o 1351.

AUSTIN, WILLIAM. — "Improvements in joining pipes and tubes, and in the packing to be employed for that purpose." These are, in reference to pipes or tubes for the conveyance of water, gas, and sewage, the ends of which abut on to each other, and consist, first, in "the application of a stop fillet either cast on the pipe or applied temporarily for preventing the sliding of the packing."

Second, "the application of indentations or grooves to prevent the pipes from being drawn asunder or separated by internal pressure."

Third, "the application of single coned sockets or collars with bolts and nuts for drawing up the sockets or collars instead of driving them."

Fourth, "the application of double coned packings and corresponding sockets or collars united by bolts and nuts, or otherwise."

Fifth, "the application of joint packings for pipes or tubes," "whether cast as complete collars, or formed of successive layers of thin sheets or strips of the material." The packing employed may be of any suitable substance which possesses elasticity, as vulcanized india-rubber, gutta percha, preparations of both these substances, canvas, or woollen or papier machè, or a combination of these substances, with india-rubber, gutta percha, or bituminous matter." In some cases "wood, metal, or other non-elastic packings may be used, having their inner surfaces which come in contact with the pipe, smeared or payed over with tar, bitumen," &c.

[Printed, *Sd.* Drawing.]

A.D. 1866, May 15.—N° 1382.

PAYTON, WALTER,—“Improvements in the construction of dry gas meters, part of which improvements is also applicable to meters for measuring water and other liquids.” These relate to that class of dry gas meters the cases of which are formed chiefly of cast iron,” with a view to obtain simplicity of construction “with facility of access to the parts thereof in case of need.” For this purpose the body is formed in two parts, each having one solid face and open end. The open ends of the two parts are united by a screw or flange joint; such joint also holds correctly in position the central partition forming the division or separation between the two compartments containing the diaphragms; this partition is also formed with a flange or flanges to receive a packing. Each part of the body of the meter is also formed with a rim projecting inwards to receive and hold by set screws or otherwise an outer rim carrying the stationary portion of one of the flexible partitions, so that such partitions may be readily removed and replaced on a separation of the parts of the body of the meter. Each of these pro-

jecting rims is also formed to contain a gas way leading to its interior when its diaphragm is in position." Also applying "to each of the axes which by arms are connected to the moveable diaphragms and by other arms are connected to the valves conical or other shaped projections to fit into corresponding conical or other shaped seats, to which they are held by spring or weight pressure so as to render stuffed packing unnecessary." This substitution for stuffing box arrangements is also applicable "to other axes of dry gas meters, and to axes of meters for measuring water," &c. Forming "the valve seats and the passages thereto of white metal or composition, with a tin or white metal cover to the passages thereof, so as to close the same by soldering." Forming flanges on those parts which pass into recesses in the cast iron parts of the meter to facilitate ready connection.

[Printed, 2s. 8d. Drawings.]

A.D. 1866, May 17.—N^o 1402.

BEALE, JOHN.—"An improved rotary engine to be used for pumping fluids or gases, or as a motive power." This engine is composed "of an outer casing or cylinder, furnished with an inlet and outlet as usual. Within this outer casing is fitted a revolving drum, the axle of which passes through a stuffing box at each end or at one end only, and is carried on antifriction rollers or otherwise. This revolving drum is mounted so as to be excentric in relation to the outer casing or cylinder, and is slotted to allow two pistons or partitions (connected so as to act as one) to slide in the drum in such a manner that the outer ends of the pistons or partitions may be always kept in contact with the interior of the stationary casing or cylinder. One of the pistons or partitions is larger than the other, the smaller piston being inserted in a slot formed at one end of the larger piston." By this "the smaller piston becomes an elongation of the larger, constituting one piston or partition extending across the whole interior of the stationary case or cylinder." The largest piston "is connected at one end by means of pins with rings capable of revolving in annular grooves formed in the end plates of the stationary case or cylinder, and the smaller piston (at the reverse end of the larger) is similarly connected with guide blocks which work within cur-

"vilinear grooves or slots in the said rings." By these arrangements "in the revolution of the axle the drum carries round "the sliding pistons, the end or edge of the larger piston being "kept in contact with the interior of the stationary case or cylinder by the pins fitting into the eyes in the concentric rings, and "the end or 'edge of the smaller piston being kept in contact "with the said interior by the sliding guide blocks working in "the curvilinear grooves or slots formed in the rings."

[Printed, 10d. Drawing.]

A.D. 1866, May 25.—N° 1468.

BUCHNER, ERNST.—(*Provisional protection only.*)—"Improvements in the manufacture of gas." These are, heating "the furnace by which the gas retorts are heated by burning therein "gas tar and ammonia water. Any suitable arrangement or "construction of furnace may be employed," but the following is preferred:—Above a pair of retorts are two reservoirs, one containing gas tar, and the other ammonia water; these reservoirs have taps and pipes leading down on to what is called "the "dropping plate. The furnace is filled in the first instance with "a little wood or other fuel once for all and set on fire, and then "the taps on the pipes leading from the tar and ammonia tanks "are opened, and these liquids flow slowly into the furnace. By "these means a greater yield of gas is obtained," &c.

[Printed, 8d. Drawings.]

A.D. 1866, May 28.—N° 1488.

DUFF, DAVID.—(*Provisional protection only.*)—"Improvements "in gas regulators applicable to burners and meters." These are, first, in "regulating the supply or flow of gas through the "burners;" forming "on the internal periphery or tube of the "lower portion of the burner a female screw thread, into which a "male screw is made to gear; this male screw is formed with a "milled edge button or disc on its upper surface, surmounted by "a tightening screw; this male screw has a wedge-shaped cavity "cut out, the apex of which is nearest the upper surface of the "metal." By raising or lowering the male screw a greater or less area is presented for the flow of the gas. To stop the supply altogether the upper portion of the burner is removed, and the valve screwed down.

Second, with regard to the regulator for meters, forming a chamber, in preference circular; one end of this chamber receives the supply pipe, the top of which is provided with a flange or seat, the inner periphery of which is made to fit the arc of a sphere, or to be of a curvilinear or dished-shape in order to receive a corresponding valve which shall fit such recess or seat, and provided with a flange or rim so as to register with the surface of the supply pipe. Above this valve and pressing thereon is placed a tapering and helical spring of very thin metal, the upper portion of which bears against the lower surface of a tubular spindle or rod having a male screw cut thereon, this rod being enlarged by a recessed head at the lower extremity, into which recess the top of the helical screw enters. This spindle works in a stopper or plug which in its turn works in the female thread of the upper or outlet gas pipe. The stopper or plug being cut with a wedge-shaped cavity whose apex is lowest. "Should the pressure of gas be very great, the lower floating or rising and falling valve will close entirely upon the surface of the lower flange of the screw plug, and stop one source of escape, leaving only that by the screw arrangement."

[Printed, &c. No Drawings.]

A.D. 1866, June 14.—N^o 1615.

MALAM, GEORGE DUNBAR.—(*Provisional protection only.*)—

"The purifying of ammoniacal liquor by an improved process, and the application of such purified ammoniacal liquor to the purifying of coal gas." This consists in employing "a desulphurating scrubber open at the top, and partly filled with coke (or other substance for increasing the circulation of air for the purpose herein-after described), a stream or shower of ammoniacal liquor is caused to descend on the coke" in the scrubber "through a 'rose' or a perforated pipe or pipes." Into the scrubber and near the bottom of the scrubber is injected or forced a current of atmospheric air "by means of a fan and suitable piping." "The commingling of atmospheric air with the descending ammoniacal liquor effectually desulphurates such liquor. The ammoniacal liquor so purified is then pumped into ordinary gas 'scrubbers,' and the coal gas to be purified is forced or drawn by the 'exhauster' through the purified ammoniacal liquor contained in the 'scrubber' or 'scrubbers,'

“ sulphuretted hydrogen and sulphur compounds are removed
“ by this operation from such coal gas.”

[Printed, 4d. No Drawings.]

A.D. 1866, June 15.—N^o 1628.

STEVENS, BENJAMIN FRANKLIN.—(*A communication from Simon Stevens.*)—“ A new or improved method of treating permanent inflammable gases, whereby greater heat is obtained therefrom.” This consists in “ mixing steam with the gas jet ; just before it is burnt the character of the flame is changed and its volume greatly increased, so that when applied, for example, to heating steam generators, it will entirely fill the spaces under the boiler and between the tubes. In lieu of passing the steam jet directly into the gas pipe or pipes as they approach the burner, the steam jet may be arranged so as to cause an increased draught of air to act upon the flame, and the mixture of gas and steam may be used either alone as gas is commonly used, or it may be employed to aid in the combustion of ordinary fuel.” The steam may be generated in a boiler heated by the above flame or otherwise ; in some cases the steam generator may form part of the fire-box or furnace in which such mixture is to be burnt.” “ By heating either lime or platina sponge or wire to an intense white heat by means of the hereinbefore described mixture of steam and gas, a light suitable for illuminating purposes may be obtained.”

[Printed, 4d. No Drawings.]

A.D. 1866, June 16.—N^o 1636.

MUNTZ, GEORGE HENRI MARC.—“ Improvements in the manufacture of certain fittings for gas, steam, and water tubes.” These are, “ in joints or connections for wrought iron tubes ” as “ two crosses or joints, having any number of ways.” “ I take a plate of wrought iron and punch a hole through the centre ; ” then “ take a bar rolled to a proper section and bevelled on one edge, and form this into a short socket, and scarf weld in the usual way ; this socket is inserted into the plate and almost through the centre hole, the bevelled edge of the socket being, by preference, on the inside ; ” “ then place both plate and socket in a suitably formed concave bottom die,” and employ “ a top die convex in form and provided with a tapered plug,” by

which "when the edges are subsequently brought together and welded," there will be formed "a complete circle with the edges scarfed and lap-welded; this constitutes a three-way or tee-joint." In making a four-way or cross joint, proceeding in the same way, but the plate "will be shorter to form one half the barrel of the tee joint only, and putting two of these parts together and welding them;" "or by another mode I punch two holes in a longer plate, and insert two sockets in them, then bending the plate round in the direction of its length, and welding the meeting edges." In "joints with more than four ways, I proceed in a similar manner, but employing longer plates to receive a greater number of sockets," and bending and welding as above. Two or more of the above plates may be used, if preferred, "I also propose to form these joints by raising the sockets out of the solid plate of metal by means of dies and punches under force or pressure, and so to avoid welding the sockets into the plates."

[Printed, 4d. No Drawings.]

A.D. 1866, July 4.—N^o 1776.

BROTHERTON, JOHN. — "Improvements in machinery for making the fittings for gas, steam, and water pipes." These are, "for shaping lap welding tees, crosses, elbows, sockets, and other junctions, and also the cocks for gas, steam, and water pipes; the machine consists of a bed upon which is mounted a number of carriages, one or more of which may be brought into action according to the number of arms or ways required in the finished fitting; each of these carriages supports at one time a shaping tool, at another a mandril, to suit the description of work the machine is required to perform at the time, and each carriage is governed by an eccentric driven by mitre wheels upon the same shaft, so that all the tools or mandrils, as the case may be, may be carried simultaneously to the centre of the machine, at which point is fixed a block to receive the swage tools." "The first operation in making a cross is to shape the two parts of which it will ultimately be formed, and for this purpose a plate of iron cut and shaped of the proper form, and bevilled on the edges if required, is placed upon a concave die in the anvil block, and a top tool or convex die worked by stamp hammer, hydraulic press, or oliver is brought down to

“dish or sink it into a semi-cylindrical section. Two similar parts, but one rather larger than the other, having been thus stamped or forged, the top tool or convex die is removed, and a counterpart of the bottom one or concave die is substituted, and two of these sunk plates are then put together and heated, and are laid into the concave die upon the anvil block; the four mandrills are advanced instantly towards the centre and lie in the four arms of the sunk plates; the hammer stamp, press, or oliver is brought into action and perfectly welds the parts.” “In making a tee or elbow joint, a plate, the same size as that which is now commonly used for these purposes, is to be placed on a suitable low or concave die, and the hammer descends and doubles it. Two dies or swage tools are made to advance from opposite sides of the machine by the same action as before described, and bend the plate in the form of a tee or elbow joint ready for welding in the manner before named.” “Wrought-iron cocks are made in the same way as a cross. The machine may be worked by manual or other power by means of a driving wheel and pinion gearing on to one of the shafts, upon which are hung the mitre wheels before-mentioned.”

[Printed, 10d. Drawing.]

A.D. 1866, July 6.—N^o 1787.

CHESNEY, WILLIAM.—“Improvements in the manufacture of water and steam cocks or stop valves, applicable also for other like purpose.” These are, constructing “a durable and efficient valve cock, or stop valve for stopping or regulating the flow of water, steam, gas, or other fluids or liquids.” It is proposed to bring the pressure to the back of the valve. “The cock is so constructed that its body or chamber has nothing to do with the fit of the valve, the said body or chamber being only a receptacle for the working parts. The working parts are fitted together separate from the said body or chamber,” and are placed in it and secured by means of joints or washers and screws, or screws and nuts. Suitable means are also provided to keep the valve from turning whilst being opened or shut. By this arrangement no undue wear is caused to the valve or face, and this is important especially where the valve faces against leather, india-rubber, gutta percha, or any other like substance. The flow of liquid is made into the bottom of the body or chamber, rushing upwards or in the same direction as that in which

the valve closes through the valve seat when the said valve is opened instead of coming in a direction opposite to the closing of the valve. At the bottom of the body or chamber is a square recess, which is to form the bed in which the square back of the valve is placed and in which it is to work.

The working parts of an ordinary bib cock consist of this square-backed valve fitting easily into the square recess. An inner hollow chamber in which are three openings, one of which is at the bottom through the valve seat, and the other two are at either side of the chamber, and it is through these openings that the liquid is to flow. Through this inner hollow chamber and through a stuffing box of proper construction goes a spindle, having a collar which fits down upon the bottom of the stuffing box upon which comes the packing. To allow the liquid to flow through the cock the spindle is turned in a certain direction.

[Printed, 8d. Drawing.]

A.D. 1866, July 12.—N° 1827.

WALKER, WILLIAM GLASSFORD, and SMITH, ROBERT FRAZER.—“A certain improved method of producing illuminating gas.” This consists, first, in the manufacture or production of gases for illuminating purposes from peat saturated with oil by carbonizing in ordinary gas retorts.

Second, “the utilization of naturally or artificially dried peat charged with oil by absorption, the oil or oils used being either in a heated or cold state, the absorption or charging of the peat being effected prior to the charging of the retort.”

Third, “the use, in addition to the oil-charged peat, of a portion of peat not artificially charged with oil in the production of illuminating gas, the natural gases of the uncharged peat being given off with those of the oil-charged peat.”

The oil preferred “is commercially known as shale oil,” or that known as petroleum may be employed in lieu of the preceding oil.” In place of using any of these oils, a part of this invention “consists in using the oil distilled from peat itself, either separately distilled or as forming part of the process of illuminating gas production under the present invention.” It is preferred to use the foregoing oils “after the spirit and portions known as ‘burning oil’ have been separated.” It is preferred to heat the oil to 120° F. and “after the absorption has taken place the oil-charged peat is allowed to drain and cool, after

" which it may be handled and packed away in stacks like coal." The materials are distilled in ordinary gas retorts.

[Printed, 4d. No Drawings.]

A.D. 1866, July 16.—N° 1854.

STARK, ALEXANDER ROGER, and WOODMAN, JAMES.—(*Provisional protection only.*)—"Improvements in the means of fixing the covers of gas retorts." These are, instead of employing the usual cross bar, the ends of which are inserted in lugs and with a screw and hand lever in the middle, using "a cross bar, but which is simply dropped into two hook-like lugs or projections in the same position as those above-mentioned," but in which the cross bar rotates as in bearings. Near the ends of the cross bar two cams are applied, "which take a bearing on the retort cover when the cross bar is rotated, and press the said cover hard up to the retort, the pressure taking effect near the circumference of the cover." A hole or holes is formed at mid-length of the cross bar into which a rod is inserted "of some length, which is used as a lever to rotate the cross bar; it at the same time serves to keep the workman at a distance from the retort, as he can lift the cross bar by the said long rod and reach it into its bearings, into which it is simply dropped as before-mentioned, and rotated by the leverage of the long arm or rod, a sufficient portion of revolution to cause the cams to take effect. The reverse operation serves to remove the pressure from the cover, which is then free to be removed."

[Printed, 4d. No Drawings.]

A.D. 1866, July 17.—N° 1866.

GEDGE, WILLIAM EDWARD.—(*A communication from Julius Brönnner.*)—(*Provisional protection only.*)—"An improved gas burner." This consists as follows:—"The gas is conducted by an ordinary burner to a closed tube or chamber of a larger size, from which it passes through a second burner of superior capacity placed above the said chamber. The size of the apertures of these two burners will be regulated by the quality of the gas, but the lower or inlet apertures should always be smaller than the upper or burning aperture. To diminish the length of the flame, which is extraordinary, and in some cases inconvenient, the gas is conducted through a layer of asbestos,

" cotton, filings, or other suitable material which will check the pressure of the gas. Under this arrangement the supply of gas is not greater than required for complete combustion, and the gas is mixed with neither more nor less air than is requisite to produce the greatest illuminating power."

[Printed, 4d. No Drawings.]

A.D. 1866, July 20.—N° 1888.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from Jaroslav Zadora Paszkowski and Olgerd Sabinski.*)—"Improvements in the mode of and apparatus for generating gas for lighting, heating, and other purposes." These are, as follows:—The vaporizing apparatus is composed of a series of cylindrical vessels forming superposed couples of unequal diameter, and enclosed in a cylinder surmounted by a reservoir, at the side of which is a glass tube or gauge, indicating the level of the hydrocarbon liquid in the same, in the bottom of the reservoir is a set valve, which is moved by a rod with a screw passing through the lid, and fitted with a nut which is operated by a small bar; on the top is a dial and also an orifice for the introduction of the liquid hydrocarbon. Skeins of wicks pass from one to the other of the series of cylindrical vessels, whatever may be the number of vessels. At the bottom of the apparatus is a tap for drawing off any liquid which may remain in the apparatus after use. The reservoir being charged with liquid hydrocarbon, the valve is slightly opened by a movement of the rod, the liquid then falls drop by drop into the upper vessel, and saturates first the upper series of skeins of wicks and proceeds downwards until all the skeins are saturated. Air is then admitted from the generator to the bottom part of the vaporizer, and being saturated with hydrogen and carbon in its passage through the wicks is carried off by a pipe in the upper part of the vaporizer to the burners.

[Printed, 8d. Drawings.]

A.D. 1866, July 20.—N° 1889.

ROWLEY, FRANCIS JOSEPH.—(*Provisional protection only.*)—"Improvements in gas pendants, gaseliers, and gas brackets." These are, "to permit, intercept, and regulate the flow of gas to the burners of pendants;" fitting at the top part of the pendant a hollow valve, plug, or thimble, in preference, conical, and

which works in a seat or socket in which is or are one or more orifices to correspond with the same in the valve or plug. The valve or plug is worked or turned by a rod or stem (working in a stuffing box or packing) which passes down through the pendant, and is actuated by a key or other turning contrivance applied at its lower end, or it may be raised and depressed by the rod by means of a screw, or otherwise, so as to open and close the orifices in the seat or socket. Instead of the gas flowing as above it may be supplied to and flows through the valve seat into the valve or plug, and thence to the burners through the rod, which is made hollow for the purpose. When a cup and ball joint is used the valve or plug may work in the ball, in the sides of which, or in a seat fitted in it, are orifices for the flow of gas through the pendant or the rod. Instead of turning the valve or plug it may be stationary, and the pendant or outer tube may be turned or raised and lowered by a knob or handle at bottom, formed of a material which is a bad or non-conductor of heat. "The improvements in pendants are applicable to gaseliers."

"To obtain strength, convenience of adjustment, and compactness" in brackets, fitting "a check plate or a false plate (also acting as a washer) in a back plate, through which plates the inner or back end of the bracket passes." Constructing a bracket with two arms or limbs connected at their inner or back ends by a swivel or swing joints with the back and check plates, and connected at their outer or front ends by a double swivel or swing joint, with an outer or front arm or portion of the bracket; or there may be two sets of back arms or limbs connected by a swivel or swing joint, a single bracket may be similarly connected. These arrangements of brackets may be applied as pendants or gaseliers by suspending or disposing of them vertically. They as well as gaseliers, &c. may be lengthened by causing portions of the same to slide telescopically.

[Printed, 4d. No Drawings.]

A.D. 1866, August 6.—N^o 2023.

MEDCALF, RALPH, and NICHOLLS, WILLIAM. — (*Provisional protection only.*)—"Improvements in couplings and connections particularly adapted for coupling or connecting gas, water, and other pipes." These are as follows:—"Upon lugs formed upon one of the pipes or portions to be connected" hinging, say, "two clips fitted lengthwise of the pipe; the tails
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" of these clips are acted upon by springs, which tend to force
" inwards catches on the other ends of the clips; these catches
" are situated a slight distance beyond the end of the pipe."
Upon this pipe is also cast a flange to form a seat for a ring
of india-rubber or other suitable elastic material which is fitted
round the pipe. The flange and ring are, say, about an inch,
more or less, from the end of the pipe, which is slightly conical or
tapered from the flange to the end. The end of the other pipe
or portion to be coupled or connected to the first pipe, has cast
upon it a ring tapered or conical externally, and by preference,
cylindrical internally. The coupling is effected as follows:—
The tapered ring is forced over the tapered portion of the other
pipe, and the catches of the spring clips are thereby pushed out-
wards until the tapered ring has passed them; when " the catches
" are again forced in by the action of their springs, and take
" behind the ring so as to hold or couple the pipes together. The
" end of the ring on the second pipe presses upon the india-
" rubber ring, and thereby prevents all escape of the gas or other
" fluid." " In some cases, as for hose pipes where the tails of
" the clips are liable to come in contact with irregularities of the
" ground," casting "upon the pipe loops or other convenient
" guards which pass over and thereby protect the tails of the
" clips."

[Printed, 4d. No Drawings.]

A.D. 1866, August 6.—N° 2025.

HAMILTON, JOHN.—"Improvements in artificial material for
" producing gas for illuminating purposes." These are said to
be the manufacture of a compound or admixture for the produc-
tion of illuminating gas, in which the heavy mineral oils left after
the lighter portions are distilled off, with or without admixture
with naphthaline, are combined in a heated state with screened or
pulverized bituminous coal," as follows, or "any mere modification
" thereof." Taking "of heated oil, naphthaline, and coal, the
" following proportions, but which proportions may be varied
" according to the degree of bitumination of the coal:—To one
" ton (i.e., 20 cwt.) of screened or pulverized bituminous coal,"
placed in a pug mill or some other admixing machine, adding
" forty gallons of the heavy oil of coal, or heavy oil of shale,
" commercially known as 'once run,' which usually contains a

" large quantity of paraffin, along with five pounds of naphthaline," and the whole thoroughly mixed. "The admixture of heated oils and coal is allowed to stand for twenty-four hours or thereabouts, or it may be compressed or made advantageously into bricks, balls, or other form, before being placed into retorts," which, in preference, are of fire-clay, and the distillation is effected at "a bright red or white heat." "The heavy oil of tar, known in commerce as naphthaline, may or may not be dispensed with."

[Printed 4/1. No Drawings.]

A.D. 1866, August 9.—N^o 2047.

TURNER, JAMES.—(*Provisional protection only.*)—"Improve-ments in wet gas meters." These are, first, "in the arrangement and construction of the inlet valve and valve box of wet gas meters," so that "the gas passes upwards through the valve in its passage to the inlet pipe and measuring drum in place of passing downwards as heretofore." "The float wire passes up through a short tube or passage formed on the under side of the valve box, the bottom of this tube or passage is formed with a valve seat within the fountain chamber, and the float wire carries a conical valve." "The float in this arrangement is formed with a tube through its centre, into which the wire is attached to the lever valve passes, and when the correct position of the float is ascertained, the float tube is firmly closed or fixed upon the wire." In another improvement relating to the float, passing "a tube from the bottom of the valve box through the centre of the float to considerably below the water line of the meter;" at the end of this tube forming a valve seat, and attaching a valve at the bottom of the float. "In order to prevent any tampering with the inlet valve, the valve box is simply soldered with a tube on the square frame." "Casting or forming the inlet valve box and valve seat in one piece." Another improvement relates to a cheap and simple manner of constructing and mounting of the lever of the inlet valve. The lever is formed "by bending a piece of metal into a trough shape, thus leaving the under part of the lever arm open to receive the end of the float wire, which is attached to the lever by a pin to form the joint. At the back end of the arm a simple slot is cut to receive a piece of metal soldered to the valve box with a

"pin to connect the lever thereto." In preference, the gas is conducted directly "to the drum chamber by means of a pipe from the valve box."

Second. In maintaining the water level in the measuring drum at its proper height, "placing the overflow tube in one corner of the square frame or front chamber," or in any other suitable position. In preference, cutting away part of the circular front plate above the water line in the measuring drum chamber, so as to form a direct communication with the measuring chamber, both for the passage of gas and water. The air tube (by preference, made of non-corrosive or other suitable metal) is placed on a small box or chamber enclosing the overflow tube, or in any other convenient part of the meter, a small hole being formed in the air tube or in the side of the box nearly on a line with the water level, which orifice forms a communication with the drum chamber the top of the air tube forming a communication with the supply fountain. "When the meter is fully charged and the water is drawn off to its proper level, by drawing off a very small quantity of water from the drum chamber, the small orifice in the air tube will become unseated (unsealed?) and gas or air will pass up the tube into the fountain chamber to re-adjust the level of the water in the measuring drum."

Third. In order to prevent fraudulent attempts a valve box is placed "at the bottom of the waste water chamber furnished with a valve carried by a float; a tube connects the valve box with the bottom of the gas inlet passage to carry off any condensed water therefrom." "When the water from the overflow tube runs into the waste water chamber up the dip tube to the overflow plug hole, the float will rise and open the valve to allow any accumulated water in the condensed water pipe to escape into the waste water chamber. Should the water be forced or drawn out of the waste water chamber so low as to permit the float to fall, it will close the valve in the box, and thus shut off any escape of unmeasured gas to the dip tube of the waste water chamber."

Fourth. In constructing the index spindle for the purpose of reducing the cost of repairs from corrosion, forming the upper end of the index spindle carrying the worm separate from the other part, and "connected by a simple clutch box or other connection."

[Printed, 4d. No Drawings.]

A.D. 1866, August 11.—N^o 2064.

KEIRBY, JOHN EDWIN.—“Improvements in packing for steam water, air, and gas-tight joints.” These are, “the combining together india-rubber or other flexible substance with wire and hemp, or other fibrous material, for the production of packing,” to be used as above, as follows, or “any mere modification thereof.” The rope or packing consists of a metallic wire surrounded by or imbedded in a layer or coating of india-rubber, around which is knitted the hemp or other fibrous material. “The hemp or other fibrous material previous to being placed over the cover of india-rubber and wire is saturated with red lead, and when so saturated is knitted over the core by an ordinary knitting machine.” A very efficient packing is made by turning a piece of the above, two or three times round in such manner as to form a ring, and this ring is “wound or bound over with hemp or other fibrous material, which may or may not be saturated with red lead.”

[Printed, 8d. Drawing.]

A.D. 1866, August 11.—N^o 2067.

ENSLEY, JOHN ISRAEL.—(*Provisional protection only.*)—“An improved apparatus for manufacturing illuminating gas and producing bone black and other valuable residuum.” The object is “to separate the gaseous and solid constituents of various substances.” “A retort is provided having a fire chamber and smoke pipe as usual” within which is a chamber which is closed except at its outer end. A set of cylinders is constructed, any one of which fits the chamber in the retort, and is made open at one end to receive the charge to be subjected to the heat. The said cylinders are provided with perforations through which the gaseous matter evolved therein escapes. When one of these cylinders is in place in the chamber the latter is closed by a cover fitting in its mouth and held in place by a pressure screw resting in a removable bearing or by some equivalent device. A pipe extends from this chamber and conveys the gas “to one of a series of purifying vessels resting in a water tank; these vessels communicate with each other through short pipes.” Each of these vessels “is also provided with cocks extending through the sides of the water tank to allow the escape of condensed water,” a pipe extends from the final condensing chamber into a gasometer

from whence the gas is distributed in the ordinary manner. "Where it is desirable to produce a compound gas for illuminating" "the mixture can be effected by simply first placing vegetable substance in the retort to produce the requisite hydrogen and then animal matter to produce the carbon. Three parts of vegetable to one of animal matter will produce the proper proportions."

[Printed, 4d. No Drawings.]

A.D. 1866, August 27.—N^o 2201.

PIERCE, WILLIAM.—(*Provisional protection only.*)—"Certain improvements in the method of purifying gas, whereby its illuminating properties are improved, and in the apparatus connected therewith." These are, "purifying coal gas and improving its illuminating powers by bringing it into contact with a certain light oil made from tar, or with certain other mineral oils in a heated state," and the improvements consist in "the application of steam or hot water to the heating of the said oil, and in the construction and arrangement of the apparatus which may be thus described." The oil is contained in a vessel internally fitted with a spiral tube or worm, or with a shell or 'steam jacket' either of which are surrounded with the oil, and when the steam is admitted from a steam chest into the worm or jacket the oil becomes heated thereby, or if preferred the bottom of the vessel may be made concave and a jet of hot water or steam may be applied thereto. This apparatus is attached between the gas meter and the burners, and all the gas passing from the meter to the burners is caused to pass through this chamber or vessel, and thereby becomes impregnated with the gas arising from the heated oil." "An opening is provided at the top of the vessel for supplying oil."

[Printed, 4d. No Drawings.]

A.D. 1866, September 5.—N^o 2277.

SUGG, WILLIAM THOMAS.—"Improvements in apparatus for regulating the supply of gas." These relate "to the construction of governors especially adapted for regulating the supply of gas to public lamps," and consist, first, "in casting

“ the cases of metal (by preference of a mixture of zinc, or lead, tin, and antimony) in brass or other metallic moulds, whereby a certain degree of perfection is ensured and the labour in finishing them greatly diminished.”

Second, “ in casting orifices or channels through the said cases in such manner as to allow of ample space for the gas to flow without interruption and at the same time afford great facility for cleansing or removing any deposit that may collect therein.”

Third, “ moulding the leather or gutta percha prepared material for the diaphragm into a curved surface, and impressing it with a number of concentric indentations or rings, whereby the rising and falling of the diaphragm by the pressure of the gas is rendered more easy and gradual in its action.”

Fourth, “ securing the diaphragm to the lower part of the case by means of a flat metallic ring screwed on its periphery.”

Fifth, “ attaching the valve to the diaphragm by metallic shields, nuts, and washers.”

Sixth, “ fastening the upper and lower cases by screws passing through a hollow D-shaped piece of metal, which while it it serves as a connecting conduit also affords means for securing the cases together.”

[Printed, 6d. Drawing.]

A.D. 1866, September 5.—N^o 2280.

WILSON, JAMES.—(*Provisional protection only.*)—“ Improve-
“ ments in street gas lamps.” These are, forming the lamps without side frame, the tap being supported and connected to the bottom by two small rods of iron secured to the top part of the lamp post; the edges of the glass sides join each other, being kept in their places by the rebates formed in the metal top and bottom only of the lamp, thereby causing no shadow on the ground below, and increasing the amount of available light from each burner. “ Two small hinged doors are placed in the bottom
“ of the lamp which enable the gas to be lighted from below,
“ no ladder being required except for cleaning, and for this
“ purpose a double-hinged door is placed at the top of the lamp,
“ which when opened falls back on the lamp and cannot there-
“ fore be swung about and broken by the wind.”

[Printed, 4d. No Drawings.]

A.D. 1866, November 13.—N° 2357.

HENDERSON, GEORGE and McNEIL, DAVID.—(*Provisional protection only.*)—"Improvements in hydraulic gas chandeliers " and in gas regulators applicable thereto and to other gas " burners or meters." These are, first, to afford greater security to chandeliers than is afforded by the present chandeliers, applying " to the exterior of the vertical tube of the chandelier a glass " which is open at both ends, and rested in a water tight manner " on a socket or cap screwed to the chandelier tube; the top of " the glass tube is then rendered water-tight by a similar cup " screwed down therein by a thread on the chandelier tube, " in which one or more apertures are made to allow of the flow " of water into the glass tube." The water is kept so that when the chandelier is drawn down to its lowest position the level of the water shall be within or above the glass tube. If the water does not appear within the glass tube it will be necessary to supply more and it is proposed to color the water red, blue, or green, the more readily to distinguish it.

Second, the regulator consists of a cap with a female screw to screw on to the gas pipe, it is tubular and furnished with a milled edge. "Above the milled edge the cap is formed with a male " screw (for the reception of a second cap or cover); above the " male screw the cap terminates by a decreased outer diameter of " tube and is furnished with a covered cylinder fitting around it " and capable of being turned thereon. The cylinder and tube " are perforated with two or more holes in corresponding positions, " so that the cap may be turned to expose the apertures com- " pletely or to partly or wholly close the same, thus regulating " the flow of gas from the pipe. The cap is then screwed over " the first to its male screw, and thus the regulator is concealed " from view and cannot be altered without removing the second " cap on which the burner is to be screwed." This regulator is equally applicable to gas meters.

- [Printed, 4d. No Drawings.]

A.D. 1866, September 14.—N° 2362.

ROBINSON, GEORGE.—(*Provisional protection only.*)—"Im- " provements in the manufacture or production of ammonia, " baryta, and strontia."

In preparing ammonia, carbonate or caustic baryta, or carbonate or caustic strontia "is first intimately mixed with coal, charcoal, or other carbonaceous matter, and heated for some time to "whiteness in a close retort or furnace. On withdrawing the "charge and bringing water or steam in contact with the red hot "mass fumes of ammonia are copiously evolved, and are to be "collected and fixed in the usual manner." The caustic baryta or strontia is dissolved out of the mass by water, and crystallized by evaporation.

To obtain caustic baryta or strontia from the sulphates, the sulphates are intimately mixed with coal or other carbonaceous matter, and heated to whiteness for some time in a close retort or furnace; sulphurets of barium or of strontium are formed; and while the sulphuret "is still intensely heated, being at least red hot, "steam or water is to be applied to it;" in a close furnace with steam, sulphuretted hydrogen is evolved, which can readily be burnt into sulphurous acid and water, and be condensed, or "as "sulphurous acid if the watery vapour be brought in contact "with the heated mass in the open air," and in either case caustic baryta or strontia remain.

"When bituminous coals are employed" in either of the above described processes, "the volatile matters proceeding from the "decomposition of the coal, and consisting chiefly of coal tar "and combustible gases, may be collected and utilized in any "convenient manner."

[Printed, 4d. No Drawings.]

A.D. 1866, September 18.—N° 2400.

STARK, ALEXANDER ROGER.—(*Provisional protection only.*)—"Improvements in the manufacture of gas." These are, the admixture of other mineral matters with coal during its destructive distillation in the manufacture of lighting gas in order to prevent the formation of deleterious gases or to convert them into illuminating gases. This, it is said, is effected by either placing a layer of additional mineral matter on the top of the coal in the retort, or it may be mixed ultimately with it or disposed in a series of layers, but it is preferred to be placed over the top of the coals; for this purpose employing a layer of limestone, ironstone, chalk, earth, or other similar substance.

[Printed, 4d. No Drawings.]

A.D. 1865, September 25.—N^o 2472.

LUNDY, JOHN JAMES.—(*Provisional protection only.*)—"Improvements in the treatment of the residues resulting from and obtained in the purification and distillation of mineral oils for the purpose of utilizing the same." These are, in reference to this subject, as follows:—"The acid tar after its neutralization with soda oil-foots, or after the neutralization of either of them with the other, or the acid tar after its admixture with an oxide or carbonate of lime, or the pitch resulting from the tar and soda refuse mixed by heat, and after the grease has been taken therefrom" by drawing or skimming off as it rises to the surface, may be mixed with coal, coal refuse, coal slack or shale (those materials being preferred to be mixed when in a state of powder), or may be mixed with sawdust, spent bark, spent dyewoods, or other similar substances to make an artificial fuel or gas producing material, or the pitch remaining after treating the tar refuse before neutralization "with sufficient mineral spirit to extract any oil remaining in the refuse tar, which can be drawn off or extracted previous to the neutralization and the spirit separated from the oil for use by means of a steam or fire still," may be treated in the same manner for artificial fuel or gas, and these may be mixed either whilst hot or cold," but it is preferred "to mix sawdust, spent bark, spent dyewoods, or other similar substances when the pitch is in a melted state, as it would be preferable so to mix the materials if intended for use as an artificial fuel or gas producing material."

[Printed, 4d. No Drawings.]

A.D. 1866, October 1.—N^o 2528.

BATCHELOR, PERCIVAL ASHTON.—(*Provisional protection only.*)—"Improvements in the construction and arrangements of retorts and settings in combination with machinery or apparatus for the manufacture of coal or other gases." These are, employing and adopting of one or more retorts of cylindrical or other form, in preference, "with angle irons or ribs internally, forming shelves," and made to revolve at any desired speed. These retorts are much larger than gas retorts now in use. "In raising and lowering retorts where several are employed, a traveller may be arranged to run on a beam or rails fixed overhead, and along the whole length of the series, to which

"suitable pulleys are attached and connected by means of a chain and balance weight to the retorts by a moveable clip" or otherwise, "the balance weight being sufficiently heavy as to overcome the weight of the retort and its exhausted charge of coke or other material, but not heavy enough to sustain the weight" of the retort and material before carbonization, so that the raising and lowering may be easily effected. In charging and discharging the retorts thus in place of manual labour, when the retorts are in position rotary motion may be given to them by any simple mechanical means, but in some cases preference will be given to carry the weight of the retort and its charge upon friction rollers suitably arranged under each end, so as to permit of rotary or other motion being imparted, and allow for expansion and contraction. Some of these rollers may be toothed and assist in communicating the required motion."

[Printed, 4d. No Drawings.]

A.D. 1866, October 3.—N^o 2537.

WEST, MATTHEW.—"Improvements in fish-tail gas burners." These are said to be "the crown flame augments made of wire or metal of a circular form in transverse section in or applied to gas burners." "The improved nipple is formed with a hollow arrangement near the top, and the flame augments, which consists of a small arch, arc, or crown of wire or other metal of a circular form in transverse section is fixed to the enlarged chamber on the outside thereof, and passes over and at a short distance above the orifice or orifices from which the gas or inflammable vapour issues; the wire is so placed that the flame impinges against it, and the light is thereby increased very considerably without increasing the consumption of gas." In the Provisional Specification it is stated that "to prevent the rushing noise made by the gas escaping from the vent," the hole is made "throughout the whole length of the burner no larger than the orifices where the gas is ignited, instead of nearly as large as the pipe which is usually the case."

[Printed, 8d. Woodcut and Drawing.]

A.D. 1866, October 4.—N^o 2558.

SAUL, DAVID HENRY, and ARMSTRONG, HENRY PRITTIE.
—"Improvements in means or apparatus employed in carburetting

"gas." These are, first, "the mode of separating the main body of the carburetting liquid in one chamber from that in which the wicks are immersed in another chamber, and regulating the supply of such carburetting liquid to such second chamber by a valve carried by a float supported by the liquid in the lower chamber."

Second, "causing the gas to pass through suitable wicks, the lower ends of which are immersed in the carburetting liquid, and the upper ends saturated with such liquid by capillary attraction," as follows:—

The carburetting liquid is poured into an upper chamber by an orifice closed by a screw cap or otherwise, and descends to a second chamber by a tube; "the height of the liquid in the lower chamber is regulated by means of a float carrying a valve." This lower chamber has "a perforated annular partition in the interior of which are hung cotton or other suitable wicks, or the space may be filled with other absorbent material. The gas passes into the 'carburetter' through a tube, and thence through perforations formed at the outer edge of a plate into the lower chamber," from thence "it passes through the perforated annular division and circulates through the wicks and other absorbent material, and thence through a tube in the centre of the lower chamber to the burners." "A portion of the gas is allowed to pass through a valve into the upper chamber or reservoir as required, so that by pressing upon the upper surface of the liquid, the 'gas may supply the requisite pressure to enable the liquid to descend to the lower chamber." A gauge is attached to the reservoir or upper chamber so as to ascertain the height of the liquid in the same.

[Printed, 10d. Drawing.]

A.D. 1866, October 17.—N^o 2679.

BRÖNNER, JULIUS.—"Improved fixing draught apparatuses and their respective supports on all kinds of gas burners, and improved gas burners, and draught apparatuses in connection with that." These are as follows:—It is stated that, "in order to obtain a tranquil flame by a draught apparatus, for instance, by a glass globe, it is requisite that the distance from the base of the draught apparatus to the beginning of the flame does not exceed a certain limit," and this is effected by brackets of

different shapes screwed on or otherwise fixed upon the burners themselves, in which brackets are fixed the globes, bell glasses, chimnies, &c., which are said to tranquilize the flame. The gas burners are made "so that the gas coming from a burner of
 " lesser opening is conducted to another with a larger opening,
 " passing or not through an intermediate layer. These burners,
 " it is said, although giving more light than other gas burners,
 " produce a very wavering flame, and are unfit for most purposes,
 " if not combined in a fixed manner with appropriate apparatuses," in which are placed the bell glasses, draught tubes, or apparatus. There is no limit "in the shape or dimensions to be
 " given to the arrangements, by the aid of which the same end
 " may be attained."

[Printed, 8d. Drawing.]

A.D. 1866, October 23.—N^o 2733.

GREENSHIELDS, JAMES.—(*Provisional protection only.*)—
 " Improvements in making gas and coke." These are, "employing a peculiar combination of substances of comparatively
 " small cost." The substances named are, shale, paraffin, tar or pitch, lignite or brown coal, common coal, sawdust, peat.
 " These substances may be combined in various proportions, and
 " one or more of them may be dispensed with when not obtainable
 " at a low enough cost in any particular locality. A very good
 " result is obtainable with shale, common coal, and peat, in the
 " proportions of two tons of shale to one ton each of the coal and
 " peat. Greater or less portions of the other substances herein-
 " before mentioned may be included either in place of portions of
 " the coal or peat, or in addition to these substances." The substances are "intimately mixed in the ground or pulverized state,
 " or by grinding them together," and distilled in retorts such as are used for ordinary gas making, and about at the same temperature. "The gas obtained possesses great illuminating power,
 " whilst the residue in the retort is a coke of extremely good
 " quality."

[Printed, 4d. No Drawings.]

A.D. 1866, October 25.—N^o 2755.

BROOMAN, CLINTON, EDGECLUMBE.—(*A communication from Jean Baptiste Marie Amédée Bourrieff.*)—(*Provisional protection*

only.)—"Improvements in apparatus for lighting and heating." These are, constructing "smoke preventing apparatus for lighting and heating by gas or oils." "An arrangement of apparatus suitable for theatres, to be placed, say, before a box. It has externally the form of a lantern with six faces, terminated at top by a hexagonal pyramid, and at the bottom by a similar pyramid but inverted." "The middle portion or lantern is covered by a horizontal reflector, and contains the flame; its sides are composed of prisms of crystal or other suitable material." "When the apparatus is in the form of a globe, the prisms will be replaced by parts of a globe; in the lower pyramid is the gas holder or box, which may be supported by a knob or button at the bottom of the apparatus; when oil is used instead of gas, the lower pyramid contains the oil reservoir." The draught tube leads from the top and the gas tube runs along it in a groove, "it enters the lamp, and after following the contour of the lamp, terminates in the gas box." There is a curved reflector at one side of the burner. One face of each part of the lamp forms a door for cleaning, lighting, and admission of air. In theatres, &c. the draught tube is bent into a horizontal position, and may be concealed; it terminates in a pipe, which is led round the "circle" or galleries of the theatre for warming the feet of the spectators; and "is enclosed in a box through which fresh air may be made to circulate by fans or otherwise in summer for neutralizing the heat." "In another arrangement of apparatus the gas tube is led down inside the draught pipe, and there are two or more burners separated by reflectors, which reflect the light both before and behind."

[Printed, 4d. No Drawings.]

A.D. 1866, October 25.—N° 2756.

PHILLIPS, HENRY.—"Improvements in the preparation of deodorizing materials, and in the manufacture of gas." These are, "the mixing tar or bituminous substances with finely divided lime or earthy material, and distilling the same so as to obtain deodorizing materials and gas," as follows:—A quantity of slaked lime (hydrate of lime) in fine powder is well mixed with coal tar, the mixture being "in a pulverulent state," about three parts by weight of lime with from one to two parts by weight of coal tar is required for this purpose; and introduced into a retort is distilled similarly to coal for gas; "the residuum in the retort

"consists of carbon minutely diffused through the powdered lime. A large quantity of gas of high illuminating power is also produced." The residue in the retort withdrawn and quenched with water "can be used with advantage in 'dry closets,' so designated in contradistinction to 'waterclosets,' and it may be used for deodorizing the contents of cesspools." "Silt or fine deposit found in some parts of estuaries and rivers," dried, crushed, and sifted may be used in place of the lime, or the powder taken from the retort may be recharged with tar, "and thus the decomposition of tar may be effected with a small outlay for lime or other earthy matter." To make a deodorizing liquid, hydrochloric acid is added to the powder residue, so as to dissolve the lime, and this solution diluted with water is used with the carbon diffused through it, or the carbon is allowed to deposit, and the liquid drawn off and used. The carbon, washed and dried, is used as a pigment.

"Bituminous substances, as coal, pitch, or any foreign pitch, or the residuum of coal oil manufactured may be similarly used, and in such cases the pitch should be ground with a small quantity of either of the earthy matters, and subsequently mixed with lime or other earthy matter."

[Printed, 4d. No Drawings.]

A.D. 1866, October 25.—N^o 2759.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from William Elmer.*)—"Improvements in the manufacture of gases for the purpose of producing heat, and the application thereof to metallurgical operations." These are, in reference to this subject, "the process of obtaining hydrogen and oxygen by subjecting highly heated steam to the action of highly heated platinum, or its equivalent," and also "the process of burning the mixture of hydrogen and oxygen," as follows:—Two retorts are employed similar to those used for the manufacture of illuminating gas, but of a material capable of sustaining a high temperature, black lead is a suitable material, and they are connected together by a pipe, so that steam highly heated (about 2000° F.) in one may pass into the other called "the decomposing retort," in which platinum foil or wire or of other metals, as of palladium, iridium, or gold is placed, in such manner as to partially fill the retort, and afford a large surface for the steam to come in contact with, the platinum is heated to about 3,300 F. The

other retort, "called the heating retort, may be partially filled with " fragments of fire bricks, or other refractory material, affording " a large heating surface." The heating retort is connected with a steam boiler and the decomposing retort is connected with a gasometer. Care is required to regulate the flow of steam, if there is too much steam, the temperature of the platinum is lowered, and "the decomposition stops," and, if too little, "an " explosion may occur from the re-combination of hydrogen and " oxygen to form water." Having obtained hydrogen and oxygen, the next thing is to burn these without "danger of explosion," and this, it is said, is effected by mixing them "with an equal " volume of the gaseous mixture of carbonic oxide and hydrogen " produced by decomposing steam" in retorts similar to the above, only in place of platinum foil or wire is charcoal or coke. The burning may be effected by means of any suitable apparatus, as for illuminating gas, &c. The remainder of the Specification refers to the treatment of metals and ores.

[Printed, 10d. Drawing.]

A.D. 1866, October 29.—N^o 2788.

McBEATH, CHARLES.—"Improvements in the treatment or " distillation of shale, coal, and other bituminous substances, and " in the means or apparatus employed therefor." These are, first, " the general construction and arrangement of apparatus, and " the modes of using or applying the same for the treatment and " distillation" of the above substances "for the production of " crude mineral oils and illuminating gas."

Second, "the construction and use of an open-mouthed retort " erected over a hearth or grate for the treatment or distillation " of the above substances "into gases by the heat of their own " combustion at the open mouth of the retort (whether these " gases are condensed into oils, in the improved form of con- " densers herein described, or in any others heretofore in use, " or whether these gases are treated and used without being " condensed)."

Third, "the application of a jet or stream of steam at or near " the neck of the conduit conveying the gases from these " improved retorts to their condensers, or applied to other retorts " or condensers heretofore or at present used for the distillation " of the above substances, "whether used in connection with the " returned currents of uncondensed gas from the condensers or

"not, and whether these currents of gases to and from the condensers are assisted or partially produced or not by a fan or other equivalent blast in addition to the said steam jet." The permanent gases which have not been condensed, after passing through each condenser in succession, from one end to the other and up through the short pipes, joining them at their alternate ends, are either allowed to escape at the valved pipe and are burned, or are conducted and stored in large vessels for general lighting or heating purposes, or a whole or a part conducted and burned under the gate.

[Printed, 1s. 6d. Drawings.]

A.D. 1866, October 31.—N° 2827.

HOLDEN, JAMES JOHN, and BEST, SEALY JAMES.—"Improvements in the doors or closures of gas retorts." These are, "the employment of a chamber for establishing communication between two, three, or more retorts, such chamber having a door, whereby access is afforded to such two, three or more retorts at the same time." This chamber is furnished at top with the pipe by which the gas passes off to the hydraulic main; the front of the chamber is formed by means of a sliding door opening and closing the whole of its front, which is of an area greater than the height or width occupied by the ends of the retorts. The door is counterbalanced, and slides up and down in front of the chamber, the act of which opens and closes the chamber and retorts. The door jams up against the chamber by its weight and by the wedge form of channels forming its receptacle. Sometimes employing chambers with ascension pipes at one end of the retorts only, while at the other end the retorts have no such chambers, but are closed "by any ordinary means usual for closing retorts."

[Printed, 1s. 2d. Drawings.]

A.D. 1866, November 2.—N° 2841.

WATSON, GEORGE.—(*Provisional protection only.*)—"Improvements in reflectors and ventilators in connection with gas and other lights." These are, "the saving of gas or other illuminating agent, and the availing of the heat of the lights for ventilating in an efficient manner." In one modification "there is a pendent gas pipe with a horizontal bottom pipe having a

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" number of burners in it. At a little distance above the burners
" is an oblong rectangular reflector framing carried by the gas
" pipe, or by independent chains from the roof or a bracket over-
" head. The sides of the reflector framing are inclined, so that
" the bottom is the wider part, and the inner surfaces are formed
" for reflecting, and throwing downwards and laterally, the light
" reaching them from the burners. The reflecting surfaces may
" be formed in various ways, as, for example, of bright tin plate
" either plain or indented, and by preference, protected by glass,
" or of silvered plain glass, or of silvered or unsilvered prismatic
" glass, or of platinised porcelain. The glass, or part of it, may
" in some cases be colored. There is a comparatively narrow
" opening centrally in the top of the reflector frame, and at a little
" distance above this there is a concave cover, serving to collect
" the heated gases and air drawn in by them, and lead them to a
" pipe communicating with the middle of the cover, and con-
" tinued in any convenient direction to the outside of the build-
" ing." "In other modifications the burners are arranged in
" crosses, circles, or other forms, or in two or more rows, and
" the reflector frame and ventilating cover are correspondingly
" modified."

[Printed, 4d. No Drawings.]

A.D. 1866, November 6.—N^o 2871.

WIGHAM, JOHN RICHARDSON. — "Improvements in illumi-
" nating lighthouses, private residences, railway stations, mills,
" factories, and other buildings, and in apparatus and gas burners
" employed for that purpose." These are, first, "the employ-
" ment for ordinary illuminating purposes of a gas prepared from
" alcohol and sulphuric acid, with or without the admixture of
" other known substances capable of forming illuminating gases."
Second, "the construction of apparatus for producing the said
" gas." Employing "an apparatus consisting of two closed
" receptacles of lead, earthenware, glass, plumbago, or other
" similar suitable substance," into one of which the alcohol and
" sulphuric acid are introduced through a pipe provided with a
" proper funnel, "or otherwise, and applying heat; from the first
" vessel the gas is conveyed into the second vessel containing
" water or other liquid to wash and purify the gas, and from
" thence it is conveyed by a pipe to a gas holder for supplying
" the gas to the lamps or burners."

Third, "the various arrangements of gas burners in combination with oxidizing cylinders," and with "both oxidizing and equalizing cylinders." The cluster of gas jets, the equalizer, and the oxidizer are the same as described in No. 945, A.D. 1865. Surrounding the first cylinder or oxydizer is a ring of gas jets placed a little above the lower edge of this cylinder, and above the tops of the flames from these jets is a second oxydizer; surrounding this cylinder is again another ring of gas jets, and above these another oxydizer, and so on, one or more other rings of gas jets and their respective oxydizers being arranged "one above, and surrounding the other according to the illuminating power required."

[Printed, 8d. Drawing.]

A.D. 1866, November 6.—N° 2873.

TAYLOR, NATHANIEL FORTESCUE.—"Improvements in means for operating on air or aeriform fluids by hydrocarbons for purposes of illumination." These are, the air or aeriform fluid to be acted upon "is forced to traverse in an annular space between the inner surface of a cylindrical vessel, and the outer surface of a cylinder revolving within that vessel. The cylinder carries the sponges or other matters to hold the liquid hydrocarbon in suspension in ribs or rows across or otherwise applied to its surface in the annular space." "The direction of motion of the cylinder is such as to cause the matters saturated with the hydrocarbon to meet the flow of air and aeriform fluid, and thereby facilitate absorption of the vapour of the hydrocarbon. In order that the sponge or other matter may be continually saturated, the hydrocarbon for that purpose is held in regulated quantities in the lower part of the vessel, so as to supply such matters in the rotation of the surface carrying them. The quantity of hydrocarbon so held is regulated by a float acting on an equilibrium or other supply valve to a passage from a suitable reservoir," which, in preference, is air tight. "The pressure in the saturating chamber and in the upper part of this air-tight reservoir is equalized by a pipe of communication between them. The inlet and outlet passages for the air or aeriform fluid from the saturating chamber are formed with angular openings, or openings of progressively varying area, adapted to cause such fluid to be distributed uniformly in the

“ space for saturation. The ends of the periphery of the revolving cylinder are packed to prevent the air or aeriform fluids to be acted upon from passing in any other direction than through the annular space. In some cases the air or aeriform fluid may pass through successive apparatus, and in such cases the communication to the successive apparatus is regulated by double action valves.”

[Printed, 1s. 10d. Drawings.]

A.D. 1866, November 8.—N^o 2908.

THOMSON, JAMES.—“Improvements in gas stoves for heating and cooking.” These relate to means whereby more perfect combustion of the gas is effected, and for this purpose constructing a stove consisting of two chambers connected together but at a short distance apart by hollow pillars or tubes open at their ends to both chambers. In the upper chamber is fixed a tube in the centre of which is supported a ring burner. The hollow pillars or tubes are filled with small wires or tubes so as to form very small passages. A tube rising to within a short distance from the top of the lower chamber serves to conduct away the gases produced by the combustion of the gas. On the top is a cover rendered air-tight by luting, if desired, such cover may be removed and a culinary or other vessel may be placed over the opening. When employing the apparatus for heating water “the apparatus is constructed with only one chamber, consisting of two annular boilers placed one within the other and one circular boiler applied at the top.” The boilers are connected together by tubes in order that a proper circulation of water between the different boilers may be maintained. A ring burner is fixed in the centre of the chamber, a pipe or tube conveys away the products of combustion to the outer atmosphere, and a tap for running off the contents of the vessel when desired. When employing the apparatus in combination with an oven, dividing the upper or combustion chamber into two parts horizontally, the upper portion being provided with an oven formed in any suitable manner so as to allow the products of combustion to pass around the oven; the upper portion being luted to the lower portion; the upper portion may be removed when desired, and a boiler or other vessel may be placed thereon; employing a regulator formed of an ordinary

burner placed in the interior of the gas pipe, but "other suitable regulators may be employed."

[Printed, 10d. Drawing.]

A.D. 1866, November 8.—N° 2909.

SHAW, GEORGE.—(*A communication from August Conrad Dewies.*)
—"Improvements in the manufacture of coke and the small coke
"called breezes, and in the manufacture of coal gas." These are,
"first, "crushing or reducing to powder the coal from which the
"coke or breezes are to be manufactured, and mixing with the
"powdered coal lime or chalk or other calcareous substance,
"which on being heated yields lime, and after exposing the
"coal, so treated to the coking process, or to decomposition in
"gas retorts, quenching the coke while at a red heat with a
"large quantity of water, so as to remove from the coke the
"sulphide and phosphide of calcium formed by the combination
"of any sulphur or phosphorous in the coal with the calcium of
"the lime."

Second, "manufacturing coal gas free or nearly free from
"sulphur by crushing or reducing to powder the coal from which
"the coal gas is to be manufactured, and mixing with the pow-
"dered coal lime or chalk or other calcareous substance, which on
"being heated yields lime, and exposing the coal so treated to
"heat in a gas retort."

[Printed, 4d. No Drawings.]

A.D. 1866, November 14.—N° 2983.

TRUSS, THOMAS SEAVILLE.—"Improvements in the con-
"struction of pipes, and in the mode of joining the same for the
"transmission of gas, water, steam, air, and other fluids." These
are, the construction of flexible joints, as follows:—Pipes are con-
structed with a circular or conical-formed groove round the outer
surface of the pipes at or adjoining their ends, and a band is
constructed to embrace the ends of the pipes when they are brought
together to be jointed or connected. "The band is constructed of
"one piece or in several parts or segments, the several ends of
"the same forming ears or projections for screw bolts to pass
"through in order to secure together the ends or several segments
"or parts into which the band is divided, The interior of the
"band is constructed with two raised circular or conical-formed

" beads or projections on the internal circumference at or adjoining the outer edges, which beads or projections fit into the grooves round the pipes." Between the surfaces of the grooves on the ends of the pipes and the beads or projections in the interior of the band, india-rubber or any other material suitable for making gas, water, steam, and air-tight joints is applied; then by drawing the ends of the band or the several parts or segments together by the screw bolts passing through the ears or projections formed at their several ends, the required pressure is applied upon the joint-making material to make a gas, water, steam, or air-tight joint," which is "flexible, allowing of the oscillation of the pipes without impairing the tightness of the joint."

[Printed, 8d. Drawing.]

A.D. 1866, November 23.—No 3085.

TYERMAN, FREDERICK.—"Improvements in shades or protectors for shielding the eyes from the glare of strong light." These are, constructing or adjusting protectors or shades "so as to obstruct, more or less, those rays of light which would otherwise impinge directly upon the eyes, but not to interfere with the general diffusion of the other light rays." The form of and material composing this shade may be varied according to taste; it may consist of a plain or ornamented disc of opal glass with or without frame; or of metal such as thin brass stamped to assume the form of leaves, flowers, &c. "Various modes of fixing the shade or protector may be adopted," but the most convenient mode consists "of a rod or spindle connected by a universal swivel joint to the shade, and having a ring or clip formed on the spindle, which will fit round or grasp any convenient part of the gas-fitting lamp or candle, the shade or protector being adjusted to any angle or position," and fixed there if necessary by a tightening or set screw. "In some cases a series of sockets may be formed round a lamp so as to have two or more shades." "If preferred, the rod or spindle carrying the shade may be fitted into a separate stand of its own." "By rendering the back of the shade reflective a certain amount of additional light may be thrown into the apartment but of course in the opposite direction to the eyes,"

[Printed, 8d. Drawing.]

A.D. 1866, November 27.—N° 3126.

TOMLIN, JOHN, and HOOK, CHARLES.—(*Provisional protection not allowed.*)—"The manufacture of gas, and the preparation of "fuel." This, it is said, consists in manufacturing the above "from materials comparatively valueless, and in combination with "other articles of superior efficacy," as follows:—Into suitable retorts (those ordinarily employed for making gas from coal), placing "petroleum, mineral naptha, rock oil, mineral or "vegetable tar, the empyreumatic oil and fatty principles evolved "in the process of charring bones, crystal oil, paraffine, cocoa nut "oil, also all and every other animal and vegetable oil and liquid "and semi-fluid product resulting from the destructive distillation of animal and vegetable matter, or any one or more of "these "liquid hydrocarbons, which are treated or combined with "spent tanner's bark, peat, or bog earth, fir cones or fir apples, "damaged cotton, cotton waste, husks or pods, maize or indian "corn, sugar cane, ashes from peat coal or wood, animal and "vegetable charcoal, coal dust, refuse of dye works or wool "factories, burnt clay and other mineral, vegetable, and animal "absorbent," previously dried in the sun, or by other means the most convenient or inexpensive. The use of "bituminous shale, "asphalte, lignite, bituminous limestone or such other solid "mineral as will be comprehended under the denomination of "solid hydrocarbon," "coal in the ordinary acceptation of the "term being excluded." These solid hydrocarbons are in a state of rough pulverization and are treated with the absorbents already enumerated. In making the improved fuel, the before-mentioned hydrocarbons, or any one or more of the same, are incorporated or mixed with the absorbents and formed into "conveniently sized lumps or bricks for the purpose of their "after employment as fuel."

[Printed, 4d. No Drawings.]

A.D. 1866, December 3.—N° 3171.

MALLET, JULES THÉODORE ANATOLE.—"A process and apparatus for producing jointly or separately oxygen and chlorine "from the same chemical substance and in the same apparatus." This consists as follows:—Sub-chloride of copper (Cu^2Cl) is by the action of the oxygen of the air transformed into an oxy-

chloride which loses its oxygen at a dark red heat, passing again to the state of sub-chloride and so forth. The apparatus are cylindrical cast-iron retorts coated with an enamel unattackable by chloride of copper, one for instance, with base of borate, silicate, phosphate of copper, or any other which may be alike efficient. At the bottom of the retorts are plug-shot openings, and in the elongation of the figure axis there is an exit tube. The retorts are placed horizontally in a furnace and supported by a system of rollers which allow of their rotation round their axis with the least possible friction. "The oxichloride is mixed " with 15 to 20 per cent. of inert material, such as kaolin, porcelain, sand, or powdered fire-bricks; it is placed in the retort " and never got out of it when in regular working." When oxygen gas is alone required, "the heat minimum (dark red) is requisite. " The oxygen gas evolved passes through a washing vessel " and is collected. When gas has ceased to be evolved the retorts are cooled down and jets of water or steam are projected on it, and a draft of air is directed on it by a blower or pumps while rotating until the revivification of the material into oxychloride which is effected in from two to three hours. If instead "of water or " steam, chlorhydric acid is injected either in the liquid state or at " the state of vapour or gas, and its action is combined with that " of the air current; or, again after the revivification has been " effected, as for the oxygen, the hydrochloric acid is added in " either a liquid or gaseous state " with certain precautions, oxychloride and chloride of copper, or chloride alone, remains liable on heating to yield oxygen and chlorine, the latter is absorbed by lime and the oxygen collected in a gasometer.

[Printed, 4d. No Drawings.]

A.D. 1866, December 7.—N° 3226.

FRASER, ALEXANDER COLVIN.—"Improvements in apparatus " used in the manufacture of gas." These "consist in such " modifications and additions as will admit of the principles " described in No. 990, A.D. 1864, "being adapted to retorts constructed of clay as well as those made of iron," and are as follows:—"In forming three, or more or less, longitudinal ribs " along the interior of the bottom of the retort, all or some of " which are continued at the end up the back thereof in a vertical " direction. On the interior of the top and sides are also formed

“ channels or grooves extending nearly from the front to the
“ back, and these or some of them communicate with each other
“ by transverse grooves similar to the longitudinal ones. Between
“ the transverse or vertical grooves slightly projecting ribs are
“ also formed.” “ In some cases ribs may be substituted for
“ grooves or a combination of both may be employed. The form
“ of the ribs or grooves, as the case may be, may be varied to
“ suit the different objects for which they are introduced, the
“ upper ones being principally designed to prevent the deposit,
“ or, if deposited, to admit of the more easy removal of carbon,
“ while the lower ones are made more particularly to allow the
“ gas given off” a more ready passage for escaping from the
“ coal, &c. distilled. “ All these improvements are equally well
“ adapted for retorts ” of whatever material if “ moulded or cast;
“ they are also applicable to ovens used for distillation.”

[Printed, &c. Drawing.]

A.D. 1866, December 11.—N° 3258.

CATHELS, EDMUND SMALL.—“ Improvements in apparatus
“ for conveying and regulating the supply of gas.” These are,
first, casting on the exterior of cast-iron pipes or mains “longi-
“ tudinal bands or belts so as to increase the substance along
“ that portion of the main which is usually pierced for the
“ admission of service pipes.”

Second, making a governor the principle of which is “just the
“ opposite of the ordinary governor; that is to say, increased
“ pressure at the inlet increases the pressure at the outlet, while
“ on the contrary, diminished inlet pressure contracts the gas
“ way in the governor, and also decreases the pressure at the
“ outlet; this is, as before said, by reversing the conditions of
“ the ordinary governor, viz., by making the usual outlet port
“ the inlet of the improved governor, and also reversing the
“ position of the cone by having its apex or smaller end turned
“ downwards.” “The diaphragm is counterbalanced by an
“ adjustable weight attached to a lever in connection with the
“ spindle which carries the cone. The diaphragm may however,
“ be made of such dimensions and weight as to render a counter-
“ balance unnecessary. The space above the diaphragm although
“ enclosed by a cover may be subjected to atmospheric pressure
“ by connecting thereto a small pipe,” and leading it to any con-

venient place, but it is preferred to make this chamber air-tight and connect it with the outlet port of the governor. The governor is adjusted by sliding the weight along the lever and fixing it by a screw or otherwise. This principle "may be equally well applied " to wet governors where instead of a diaphragm a small gas " holder or ball rising and falling in a tank of water is employed." Instead of a conical parabolic or hemispherical valve, as shown, a valve flap may be preferred hinged on its upper edge to the pipe within the governor, so that it shall hang at an angle of 45 degrees to the vertical, more or less, and attaching the spindle which is carried by the diaphragm at or near its lower edge. No partition will then be required in the pipe beyond that of the moveable one which the valve itself forms.

[Printed, 8d. Drawing.]

A.D. 1866, December 15.—N° 3300.

MELDRUM, EDWARD. — (*Provisional protection only.*)—"Improvements in the manufacture of gas for illuminating and " heating purposes." These are, effecting the decomposition or conversion of parffin oil and other similar hydrocarbons "into " permanent gas by allowing the hydrocarbon either in a liquid " state or in a state of vapour to come in contact with coke, " charcoal, or other carbonaceous matter heated to redness by " admission of air inside the retort, or by the use of such other " arrangement as will admit of the carbonaceous materials being " heated to the desired temperature and the products resulting " from the decomposition of the hydrocarbon being collected."

[Printed, 4d. No Drawings.]

A.D. 1866, December 15.—N° 3308.

CLARK, WILLIAM. — (*A communication from Francis Stebbins Pease.*)—"Improvements in carburetters." These are as follows : —An air pump forces the air into a strong chamber, from thence it passes by a pipe, in which there is a check valve to prevent the return of liquid to the bottom of a carburetting chamber, on this pipe is a rose, the air is delivered into a deflector, which is an inverted vessel with notches on its lower edge. This deflector is made of different forms. In place of the rose the pipe may be in the form of a coil at the bottom of the carburetting chamber, the coil being perforated with holes, through which the air escapes.

The deflector should in this case be an annular plate secured to the wall of the carburetting chamber, the inner corrugated edge of which is lower than the outer edge; in the upper part of the carburetting chamber is a perforated or reticulated plate, which serves to mix the passing air and gas, and render it more homogeneous in quality; it also prevents the splashing of the liquid when the carburetter is placed upon a body in motion, or upon a locomotive or street carriage, or otherwise; the gas passes by a pipe above this plate to the burner. The hydrocarbon fluid, which may be gasoline, or any sufficiently light and vaporizable hydrocarbon is supplied from a reservoir placed above the carburetter by a pipe leading into the bottom of the carburetter. The air pump is the ordinary single-acting pump, with a valve in the plunger and one in the bottom of the cylinder, each opening downwards, and the communication with the compressed air reservoir is maintained or intercepted by a stop-cock. A modified and inverted form of air pump is used, in which is water as a packing above a diaphragm near the top, the piston elevating a body of air at each upward stroke, which passes through the small openings and valves in the diaphragm, and up through the water lying thereon. The piston head may be covered with a small quantity of water.

[Printed, 10d. Drawings.]

A.D. 1866, December 20.—N° 3347.

BAKER, WHITMORE.—(*Provisional protection only.*)—"Apparatus for lighting fires," "also applicable to warming apartments and for other heating purposes."

A junction is formed with a gas pipe by flexible tubing to one end of a tube similar to a common poker, but with its end somewhat spade-shaped and perforated for the escape of the gas for ignition. By inserting this end of the poker with the gas escaping therefrom ignited between the fuel in a fire-grate ignition is effected. "The perforated end of the poker may be formed to screw on, so that the same poker may have several ends." "A tap is employed to regulate the supply, or the supply may be from a separate elastic and portable chamber." In place of gas, oil or spirit may be used. According to another arrangement the gas may be conveyed to the under side of the stove by a suitable pipe, the end of which is provided with holes for the gas. This

part is of an inclined form, or somewhat of the shape of an inverted spoon, so as to prevent coals or other matters from falling into the passages. The openings for the gas are between the bottom bars. In some cases there may be applied to the grate or fire-place a frame supported on legs or a bracket, so as to receive the jets under it with a cover of gauze over, and adapted to support a kettle or other cooking utensil.

[Printed, 4d. No Drawings.]

A.D. 1866, December 29.—N° 3424.

HARRISON, CHARLES.—“Improvements in cocks or valves.” These are, in cocks or valves for regulating the transmission of “fluids, steam, air, and gases,” obtaining a much greater area of passage through them than through cocks or valves of the ordinary construction by making “the plug of each cock or valve hollow “with a transverse bridge or stop in the middle, and form screws “when required at each extreme end of the plug for uniting it to “the pipes of supply and discharge.” At each side of the bridge, making two apertures opposite each other, and fitting “on the “plug a barrel having two opposite chambers, each opening over “the bridge with their edges agreeing with the apertures in the “plug, and when required the barrel and chambers are in connection with a disc or handle wheel.” The pipes of supply and discharge are always open to the ends of the plug. In some cases one of the chambers communicate “with a hollow handle provided with a screw cap, so that when the cap is removed the “hollow handle can be connected to a union or pipe, and thus “enable the cock or valve to supply two different places at the “same or different times.” In the cocks or valves described “there is but one way or passage adapted for ordinary use, but “when two, or three, or more ways are required, there must be “a corresponding number of passages and apertures in the plug “and chambers connected with the barrel.”

[Printed, 10d. Drawing.]

A.D. 1866, December 31.—N° 3448.

CLARK, WILLIAM.—(*A communication from Alexandre Paul Victor Heurtebise.*)—(*Provisional protection only.*)—“Improvements in the manufacture of hydrogen gas and in apparatus for “the same, also in the application of the said gas for lighting

"and heating and as a motive power." These are, first, the "production of hydrogen gas and applications of the same. The "hydrogen is obtained from primary matters consisting of carbonic acid, carbon, and steam," as follows:—The carbon is placed in a retort and heated to redness whilst a current of carbonic acid is passed through it; the carbonic acid absorbs carbon and becomes oxide of carbon " $\text{CO}^2 + \text{C} = 2\text{CO}$;" the current of oxide of carbon with a current of superheated steam is introduced into another retort heated to redness; carbonic acid and hydrogen are formed and pass off from the retort " $2\text{CO} + 2\text{H}^2 = 2\text{CO}^2 + 2\text{H}$." The carbon "may not only consist of pure carbon, but other matters utilisable for the production of hydrogen" may be used, and may "be either liquid or solid, fixed or volatile, and used either separately or with a mixture of carbon." Separating the hydrogen from the carbonic acid, not as is usual, by absorbing the carbonic acid by means of hydrate of lime. The principle on which is based the separation of the gases is that of density. The gases are introduced into a receiver of a considerable depth by a pipe near the middle of the receiver. "After the mixture has remained a certain time in the receiver the gases will "become separated into three layers;" the upper one contains "hydrogen in a more or less pure state," from which it is conveyed by a pipe in the top. There is a "separating gasometer," and "pump for extracting and discharging the carbonic acid;" it consists of two sheet-iron receivers inverted in two others united together, these are connected to two other and communicate by a vertical groove in which are two displacers fixed to a balance lever having an up-and-down motion. The hydrogen is purified by lime and burned by the aid of "platina surface or wire "gauze" for light, and for heat, in a chamber to which air is supplied.

[Printed, 1s. 10d. Drawings.]

SUPPLEMENT.

A.D. 1817, November 3.—N° 4178.

HALL, SAMUEL.—“A certain method of improving every kind
“ of lace or net, or any description of manufactured goods whose
“ fabric is composed of holes or interstices, made from thread or
“ yarn, as usually manufactured, of every description, whether
“ fabricated from flax, cotton, wool, silk, or any other vegetable,
“ animal, or other substance whatsoever.”

Such goods as lace, net, &c. are pressed “through or at a very
“ small distance over a body of flame or fire, produced by the
“ combustion of inflammable gass, while the said flame or the
“ intense heat thereof is urged upwards, so as to pass through
“ the holes or meshes of the lace or net, or such other goods as
“ aforesaid, by means of a current of air, which is produced by a
“ chimney fixed over the flame immediately over the lace or net,
“ or such other goods as aforesaid.” The action of the flame has
the effect of singeing, burning, and removing from the lace or
other fabric the superfluous fibres or fur with which, in the process
of spinning, the yarn from which the lace is afterwards formed
becomes coated.

“A long piece of lace or net, or such other goods as aforesaid,
“ or several pieces united together so as to form a large sheet, is
“ made to pass between two rollers, mounted one over the other,
“ like the rollers of a flatting mill, and the lace or net, or such
“ other goods as aforesaid, are further to be extended over such
“ rollers so as to spread part of the lace or net or such other
“ goods as aforesaid in an horizontal position. Beneath this
“ part the flame is applied, and the rollers being turned round
“ will cause the lace or net, or such other goods as aforesaid,
“ to pass through or at a very small distance above the flame,
“ so that every part of the piece shall in succession be subjected
“ to the action thereof, and the velocity of the movement must
“ be so regulated that the superfluous fibres of the lace or net,
“ or other goods as aforesaid, will be acted upon in its passage
“ through or over the flame, without having time to injure the

“lace itself.” “As the lace or net, or such other goods as aforesaid, will be somewhat discoloured by the operation, it may afterwards be bleached.”

[Printed, *6d.* Drawing. See Repertory of Arts, vol. 33 (*second series*), p. 133; Webster's Reports, vol. 1, pp. 97 and 100; Webster's Patent Law, pp. 11, 30, and 47 (also p. 130, case 71), and Supplement, p. 21; Webster's Letters Patent, p. 21; Carpmac's Reports on Patent Cases, vol. 1, pp. 423 and 425; Parliamentary Report, 1829 (*Patent Law*), p. 208; and Patentees' Manual, p. 13.]

A.D. 1823, April 18.—N° 4779.

HALL, SAMUEL.—A method of “clearing articles fabricated of cotton, silk, wool, linen, and other similar materials, whether such are in a state of thread or yarn, or are manufactured by weaving, netting, knitting, or any other mode into fabrics composed of threads crossing over or connected with each other, so as to leave between them holes or interstices great or small, even so small as to be imperceptible to the eye, but through which flame or air heated thereby can be drawn. The clearing of the articles aforesaid is produced by burning or singeing off those loose fibres or ends of fibres which, not being bound or twisted into the thread or yarn, but standing out from it, give it a rough, woolly, and indistinct appearance.”

The object of this is the same as that of an earlier patented invention described above, Specification No. 4178, Old Law, the present invention consisting “in an improved current of air, and an apparatus, the object of which is to supersede the use of the chimney” described in the Specification of the former Patent, “and which gives the power of regulating and increasing the draft and rapidity of the flame or air heated thereby, in a very superior degree, and of causing it to act in a downward, horizontal, or oblique, as well as in an upward direction.” The patentee states this invention to be applicable not only to the flame of inflammable gas, but to flame and to air heated thereby, from whatsoever material and in whatsoever manner produced.

“The result of this process is, that the thread or yarn acquires a clear, distinct, wiry, and round appearance, which adds greatly to the beauty of the lace, net, muslin, calico, or any other species of goods as aforesaid into which it may be made, either previously or subsequently to the process of clearing, and thereby renders the articles more perfect and saleable.”

[Printed, *1s. 4d.* Drawings. See Repertory of Arts, vol. 46 (*second series*), p. 1; and London Journal (*Newton's*), vol. 8, p. 183.]

A.D. 1829, April 28.—N° 5783.

WRIGHT, JAMES.—“Improvements in condensing the gas or
“gases produced by the decomposition of muriate of soda and
“other substances, which improvements may also be applied to
“other purposes.” These are, in reference to this subject, “the
“more perfect purification of coal gas,” as follows.—A circular
wall is built “of from four to six feet in height and of what
“diameter may be deemed necessary for the extent of the manu-
“facture,” this is covered “with a roof or dome having but one
“outlet in the centre. The bottom of this circular chamber is
“lined with lead or other substance impervious to water,”
around this chamber is placed as many decomposing furnaces
(retorts) as can be managed. Into this chamber is forced by a
pump horizontally “as much water in which a portion of lime
“has been dissolved as can conveniently be obtained.” “The
“force pump is connected with the bottom of the chamber by
“a pipe so that the same water is constantly presented to the
“gas until all the lime be completely saturated “the whole of
“the sulphuretted hydrogen is absorbed, leaving the carburetted
“hydrogen in a state of great purity” and it passes from thence
into a gasometer which is “balanced with a weight somewhat
“greater than its own.”

[Printed, 10d. Drawing.]

A.D. 1841, March 22.—N° 8896.

RUTHVEN, MORRIS WEST.—“A new mode of increasing the
“power of certain media [gas, air, or water] when acted upon by
“rotary fans or other similar apparatus.”

This invention consists in “increasing the power of the said
“media, when acted upon by rotary fans or other similar appa-
“ratus, by causing the said media to pass directly from one set
“of fans with their fan cases” to another set and so on through
the whole series, “each succeeding set of fans acting upon it in
“the state in which it left the preceding set in consequence of
“the exit channel for the air from one set of fans forming the
“induction hole for the air to the succeeding set of fans.”

The patentee states that no particular form of fans is involved,
“provided only that the medium to be acted upon be conveyed
“directly from one to the other of the series of fans,” and “that,

“ whether the object to be obtained is a forcible jet of water or gas, or a strong blast of air, the same principal will prevail.”

[Printed, 10s. Drawing. See London Journal (*Newton's*), vol. 21 (*conjoined series*), p. 272; *Mechanics' Magazine*, vol. 35, p. 390; *Inventors' Advocate*, vol. 5, p. 213; *Macrory's Reports*, vol. 1, p. 46.]

A.D. 1846, February 27.—No 11,114.

TEMPLETON, JOHN SAMUEL.—“ Improvements in propelling “ carriages on railways, and improvements in propelling vessels.” These are, in reference to this subject, “ generating steam or vapour for locomotive engines by conveying gas thereto by a “ fixed main kept in connection therewith.” “ The communication shall terminate in or nearly in what is usually called the “ fire-box or furnace, or it may be in any other suitable chamber “ of the locomotive, or affixed to the locomotive, and in immediate communication with the fire-box or chamber.” The gas, “ which may be of the kind usually employed for lighting public “ ways, &c.” is maintained in this tube at a moderate pressure and is discharged directly into the fire-box, or first passes through a chamber and is “ consumed in this fire-box from suitably constructed burners,” the usual care being taken “ to ensure the “ perfect oxidation and combustion of the gas in the fire-box.”

[Printed, 7s. 8d. Drawings.]

A.D. 1849, March 24.—No 12,533.

MACINTOSH, JOHN.—“ Improvements in furnaces and machinery for obtaining power and in regulating, measuring, and “ registering the flow of fluids and liquids.” These are, in reference to this subject, “ for regulating the supply of gas and “ other fluids or liquids “ using a flexible valve “ as follows:— a partition is fixed in a slanting position in the tube having an opening near its middle, over which a flexible valve works, and may be put in action by any suitable apparatus.” In this instance, a lever suspended from the top of the tube is attached to one end of the valve, the other end of the valve being fixed to the partition. Another partition is fixed in the tube in a similar position to the last and with a similar opening. This opening is closed by a flat valve suspended from the top of the tube; the fluid or liquid flowing through by the flat valve acts thereon, and if it comes with too much pressure it will force open that valve and close the

flexible valve, the pressure tending to close the flat valve "being regulated by acting on the axis of the lever in any convenient manner." For measuring fluids and liquids "is a tube having an opening" at one side, one end being closed and made flat. There are three cones carried by an axis, and each cone moving on its own axis. The flow of "the liquid or fluid through the flexible tube will be that the same will be distended behind one of the rolling cones, and as one of the rolling cones goes out of action the other comes into action, so that there will at all times be a closed portion of the tube under a cone, and thus the quantity from the commencement of the tube to the passing off of a cone being known, a recording apparatus being applied to the axis will record the quantity which has passed, and this will be the case whether the pressure of the liquid or fluid is the cause of motion of the cones, or the axis receives motion from any suitable power."

[Printed, 1s. 8d. Drawings. See Repertory of Arts, vol. 15 (*enlarged series*), p. 9; Mechanics' Magazine, vol. 51, p. 306; Patent Journal, vol. 8, p. 5.]

A.D. 1849, November 24.—N° 12,863.

ADOR, AMBROISE.—"Improvements in producing light." This invention consists in "combining apparatus for vaporizing hydrocarbon with an intermediate of a gas burner and the tube which supplies it with gas." The apparatus is composed of (1), an ordinary Argand burner with a glass chimney and a deflector of platinum; (2), spherical or other shaped vessels, one above the other, and both above the burner. Two tubes lead from the lower vessel to the burner, and a single tube connects the vessels. The upper vessel is charged with gas and hydrocarbon, and when the burner is lighted the lower vessel becomes heated; heat is conducted to the upper vessel, a portion of the liquid becomes vaporized, gas and vapour descend into the lower vessel, and thence to the burner. By such means "the combustion of gas will be greatly improved, the intensity of light increased, and the means of obtaining light cheapened."

[Printed, 6d. Drawing. See Repertory of Arts, vol. 16 (*enlarged series*), p. 13; London Journal (*Newton's*), vol. 37 (*conjoined series*), p. 24; Mechanics' Magazine, vol. 52, p. 438; Patent Journal, vol. 9, p. 119.]

A.D. 1849, November 29.—N° 12,868.

BARLOW, CHARLES.—"Improvements in the manufacture of a certain pigment." These are, in reference to this subject,

" the application of carbonic oxide gas in conjunction with steam, " or of common coal gas in the manufacture of zinc white," as follows :—Air is blown by means of a fan through a pipe into a furnace in which ignited red hot charcoal has been placed to the depth of three feet six inches, and the gases generated in this furnace are conveyed by a pipe leading to a furnace containing red hot crucibles into which red hot zinc is afterwards poured ; when the gas at the end of a pipe terminating with a stop cock in the open air is found to burn with a steady purple flame the stop cock is shut, the red hot zinc is then placed in the crucibles. Air which has been heated in its passage from the fans is admitted into what is called the oxidizing chamber which is above the crucibles. The carbonic oxide gas is now allowed to pass either into the crucibles through small holes surrounding the aperture, or in the crucible cover, "as the vapour of the zinc " rises that and the gas burn together, and both take oxygen " from the heated air " and the result is a snow white product which is blown through a passage into a receiver where it meets with steam which enables any uncombined oxide to unite with the free carbonic acid. In another arrangement the melted zinc is operated upon in curved tubes. In place of charcoal coke may be used, but before doing so the gas must be passed through a lime purifier, "where common coal gas is used the usual " apparatus is employed to produce it, and no steam is necessary " as the hydrogen in the coal gas produces water in sufficient " quantity."

[Printed, 1s. 10d. Drawings. See *Mechanics' Magazine*, vol. 53, p. 436; *Patent Journal*, vol. 11, p. 33.]

A.D. 1850, March 11.—N^o 13,003.

WILKINS, WILLIAM CRANE.—" Certain improvements in " ventilating, heating, and lighting, in lamps and candlesticks, " in the manufacture of candles, and in the apparatus to be used " for such purposes." These are, in reference to this subject, first, " preventing any irregularity or oscillation of a flame from " a gas burner produced from the too violent admission of air " to the flame " by " modifying and regulating the supply of " air, by allowing it to pass in its passage to the flame through " numerous small apertures " in a plate.

Second, preventing the noise called " fizzing " produced from the gas having a too free and direct passage to the burner. The

burner is constructed so as to render the passage of the gas more tortuous; the pipe or socket into which the stem of the burner enters is made larger. The burner end of the stem is plugged up, and the gas is made to pass "through lateral holes in the sides of the stem." In some cases such burners are "likewise provided with a stem mounted vertically upon the top of the burner, which stem carries a circular conical reflector, by which the light from the flame is reflected around."

Third, producing a greater degree of illumination, by placing upon the burner a ring so as to leave numerous spaces or apertures "between the ring and the burner, through which air passes to the flame."

Fourth, increasing the extent of the flame from gas burners by placing a curved ring over the burner, the curved part of the ring expanding from the burner.

Fifth, to maintain an equal and uniform supply of gas to the burner under all degrees of pressure, by placing a conical valve between the ends of two tubes or apertures and falling over the lower aperture, and enclosed within a box, both the tubes have lateral apertures in them, through which the gas passes, should the mouths of the two tubes be closed by the pressure of the gas upon the conical valve. Another apparatus for regulating the supply of gas to the burner consists of an elastic disc between two tubes, an upper and lower one stretched across and secured to the sides of the box and perforated with numerous holes through which the gas flows; the gas flowing through the lower tube with increased pressure, the flexible disc assumes a convex form and according to pressure partially or entirely closes the upper tube; there are lateral apertures in the upper tube. Another arrangement with an elastic cap over the lower tube is described. In some cases applying regulating valves or apparatus to stop-cocks for regulating the supply of gas to burners, or gas meters. Dispensing with the hydraulic or water joints in elongating or sliding pendants and effecting the same object by "the use of a tube formed of vulcanized india-rubber or other similar elastic material," arranged so as to allow the inner tube to slide up or down "within the outer tube without allowing any escape of gas." Another sliding pendant is described having "click apparatus for retaining the pendant tube at any required height."

Sixth, "illuminating by means of gas, marine floating buoys, " or floats," by enclosing in their interior flexible cases or bags which are charged with gas from time to time. The buoy or floating body is surmounted with a lamp or lantern provided with a burner or burners.

Seventh, coating or covering metal reflectors with silver lustre and again coating or covering these surfaces with glass or some vitrified substance.

Eighth, "the construction of portable and other stoves heated " by the combustion of oil or gas, and their application to " heating buildings, also the combination of such stoves with " reflectors for the purpose of heating and lighting apartments." " The tops of the metal chimney above the ordinary glass " chimney is surmounted by a dome or bell trap by which the " currents of warm air are deflected down to the water con- " tained in the top of the stove preparatory to their passing " through the perforations in the upper plate. By this means " they are supplied with moisture previous to passing into the " apartment."

[Printed, 3s. 2d. Drawings. See *Mechanics' Magazine*, vol. 53, p. 219.]

A.D. 1850, May 22.—N° 13,079.

DUMESTE, JULES FREDERICK MAILLARD.—"Improvements " in reflectors for luminaries." This reflector is described as adjusted to a gas burner, but it can be applied to burners of different kinds "by regulating the setting of the reflectors and the " currents of air according to the size and form of the burning " apparatus." The burner has "at its lower extremity a small " jutting-out part," which receives a large ring or socket united to an upper ring or socket by three arms. The lower socket and the arms are united "by casting them together;" the upper socket is connected to the lower one by a rim attached to the arms. One of the arms "is elongated outside" to support a rod which is riveted to it. When the sockets are placed in position a reflector of corrugated glass is adjusted thereon, and a glass chimney, "corrugated externally, but it may also be corrugated internally," is placed upon the reflector. The rod passes through a hole in the reflector and maintains the chimney in a vertical position; for this purpose it carries at its upper end a piece consisting of a nut and two projections which fit into the top of the chimney;

the rod passes through the nut and is secured to it by a milled head screw.

[Printed, 4d. Drawing. See London Journal (Newton's), vol. 37 (conjoined series), p. 227; Mechanics' Magazine, vol. 53, p. 448; Patent Journal, vol. 10, p. 222.]

A.D. 1850, October 24,—N° 13,302.

SHEPARD, EDWARD CLARENCE. — (*A communication from Floris Nollet.*)—"Improvements in electro-magnetic apparatus suitable for the production of motive power, of heat, and light."

The following improvements relate to the present series:—

The decomposition of water, &c. is effected by charging the portions of the liquid "with fluid" [electric fluid?] "of a corresponding character." A decomposing apparatus in which this object is accomplished consists of a glass tube with two branches, into each of which an insulated copper tube (having at its end a number of fine platinum wires) is luted. India-rubber tubes (containing the liquid and dipping into it) conduct the current to the copper tubes by an exterior metal electro-coating; thus the liquid is "electrified by induction" and the evolution of gas is assisted. "The liquid of one side passes to the polar tube of the other and reciprocally." If the hydrogen thus produced is intended for lighting, it is passed through camphine, with an essential oil or hydrocarburet to render the flame more white and intense.

"Apparatus for lighting in a vacuum." In an exhausted glass globe polar wires conduct electricity to a cylinder of charcoal, which is thereby rendered incandescent; a cylinder of lead in a tube connected to one wire forces the charcoal down on to a cone of charcoal on the other wire.

[Printed, 2s. Drawings. See Mechanics' Magazine, vol. 54, pp. 358 and 361; and Patent Journal, vol. 11, p. 63.]

A.D. 1850, December 19,—N° 13,414.

BACHHOFFNER, GEORGE HENRY, and DEFRIES, NATHAN. —"Improvements in obtaining light and heat and in apparatus connected therewith." These are, in reference to this subject, first, the means and apparatus for burning gas for the purposes of heat.

A moveable fire-grate has perforated iron tubes for horizontal bars, which "may be covered with wire gauze, perforated talc, "or platina foil or iron balls." Beneath this three or more jets of gas pass through the above materials on which is placed shreds, parings, or thin plates, or stout leaves of metal or platina, known as spongy platina or the metallic compound formed by adding to a solution of copper a solution of bichromate of potash, then a solution of carbonate of ammonia, the precipitate, called bichromate of copper, is washed, dried, and ignited and "may be "used as and for the same purpose as spongy platina."

Burning what is known as diluted gas by passing the gas through perforated platina foil or talc not less than thirty holes to the square inch, in place of wire gauze or lumps of pumice as was "ordinarily done." Also employing layers of metal balls not affected by heat, such as iron.

A gas ventilating stove with a central descending and ascending flue about two inches in diameter which passes into a chimney or into the open air; the descending part of the flue is surrounded with a cylinder of glass or talc. In this there are three or more burners "having wire gauze, perforated talc, perforated platina, "or the balls before described, arranged so that the gas may pass "in a diluted state through the perforations as before described." A deflector is over the flue to assist in directing the downward current. A glass or iron dome covers the fire-box, and in the upper part of the ascending flue is a gas burner which is extinguished as soon as the downward draft is obtained. In cooking stoves arranging two steamers so that one gas burner (a series of small jets) "is made sufficient for the several purposes "of baking, steaming, and roasting." An open stove is shown in which the gas escaping from perforated rings first passes through a perforated metal plate upon which is placed the materials as before described, the gas being ignited as also described.

Second, constructing shades for lamps. A wire frame is formed, the upper and lower ring being of perforated metal; "on this frame pieces of glass, ground or plain, porcelain "or enamel, as rods, plates, or prisms, or any other bodies "capable of reflecting light, as rods or strips of polished metals, "&c., or tubes of glass silvered on the inner side; these are "placed side by side round the frame, and are retained in their

" position by being fastened by fine wire to the perforations in
 " the upper and lower ring."

[Printed, 1s. Drawings. See Repertory of Arts, vol. 18 (*enlarged series*),
 p. 87; Mechanics' Magazine, vol. 54, p. 519; Practical Mechanics' Journal,
 vol. 6, p. 46; Patent Journal, vol. 11, p. 183; Journal of Gas Lighting,
 vol. 2, p. 144.]

A.D. 1852, October 2.—N° 187.

MILLER, ALEXANDER.—"Improvements in the treatment or
 " finish of textile fabrics and materials." These are, first, "the
 " general arrangement and construction of machinery for singeing
 " or finishing piece goods and other fabrics."

Second, "the system or mode of actuating singeing machines
 " wherein all the movements are driven by a single continuous
 " mechanical mover."

Third, "the system or mode of working singeing machinery
 " wherein the fabric to be signed is drawn through from behind
 " without the aid of leading strings."

Fourth, "the application and use in gas singeing machines of
 " two or more rows of burners or lines of flame on each side of
 " the fabric."

Fifth, "the system or mode of connecting the suction or exhaust
 " funnel mouths to the lines of burners by means of clear open
 " slits or apertures."

Sixth, "the application and use of a heated surface over which
 " to pass the fabric prior to its being singed."

Seventh, "the application and use in hot plate singeing
 " machines of a duplex series of heated surfaces so as to effect the
 " singeing of both sides of the piece at one operation."

Eighth, "the system or mode of singeing the two surfaces of
 " fabrics by reversing the fabrics in the operation of passing
 " through the machine."

Ninth, "the system or mode of adjusting the contact pressure
 " of the goods upon the heated plates or surfaces by means of a
 " simultaneous parallel action."

Tenth, "the application and use in singeing machines of a
 " self-acting undulating movement for laying the folds of the
 " goods."

Eleventh, "the system or mode of arranging singeing machines
 " wherein one or both surfaces of the goods may be singed at the
 " same time."

[Printed, 1s. Drawings.]

A.D. 1852, October 12.—N^o 345.

PERKES, SAMUEL.—(*Provisional protection only.*)—"Certain improvements in navigable vessels and propellers."

Respecting the subject of the present work the inventor states
 "I also propose to use the smoke from steam vessels, and
 "convert the same into gas, and light up vessels with the same
 "in certain cases where required, or use other materials for
 "generating and using gas on board ships or sailing vessels for
 "lighting and cooking and other useful purposes, instead of
 "ordinary fires and candles. Also I employ warm water or steam
 "pipes for the purpose of warming the apartments, &c., instead
 "of fires. Also, I claim the manufacture & application of gas
 "on board sailing vessels, and the use of the same thereon."

[Printed, 4d. No Drawings.]

A.D. 1852, November 2.—N^o 615.

ARCHIBALD, CHARLES DICKSON.—(*A communication.*)—"Improvements in lighting and heating." These are, first, "the mixing of water or aqueous fluids with pure hydrocarbons which are either volatile in themselves, or rendered volatile by solution in aldehyde, wood spirit, ether, or alcohols or their equivalents, so as to form mixtures capable of hydrating atmospheric air passed through them, and rendering it suitable for producing light and heat."

Second, the production "of a permanent gas capable of being collected and retained in reservoirs, and of being conducted in pipes and tubes, and burned at ordinary, or even at low temperatures without the application of artificial heat or any other means to sustain the temperature," by "passing air in its normal state through the above mixtures, or saturating the air first with moisture by passing it through water, and then passing it through hydrocarbons, but the first method is preferred;" as also the following mixture:—"Benzole, 1; alcohol, 2; water, 1½."

[Printed, 4d. No Drawings.]

A.D. 1853, March 7.—N^o 575.

CAROSIO, AUGUSTINO.—"A hydro-dynamic battery, or new or improved electro-magnetic apparatus, which, with its products,

" are applicable to the production of motive power, of light, and of heat."

This invention " consists in apparatus or machinery for decomposing water or other suitable liquid by means of electricity, obtained from an electrical apparatus constructed on the principle of that known as ' Grove's gas battery,' or of a battery similar thereto, and in employing separately the gases so obtained for the production of motive power by their elastic force, and afterwards in recombining such gases in the gas battery to form the liquid from which such gases were originally produced; and in which recombination a current of electricity is generated for decomposing the water or other liquid employed."

In a " paper " in explanation of the Provisional Specification, the battery is called the " combinator;" the cells for the decomposition of water, the " regenerator;" and a " multiplier " is described, which receives the gases, regulates, and equalizes their pressure, and transmits them to separate piston and cylinder engines to produce motive power.

A " lucifer combinator " or battery is described, in which an electric current is obtained from the combustion of the gases.

" In order to supply any deficiency in the quantity of gas," " a magneto-electrical machine, driven by the engines, may be applied to decompose water," " and thus obtain a supply of the required gases."

[Printed, 1s. 2d. Drawings.]

A.D. 1853, November 21.—N^o 2705.

CASHMORE, JOHN.—(*Provisional protection only.*)—" An improved mode of communicating signals on railways."

The inventor proposes " to supply the railway from end to end with a gas main, and at proper intervals of distance to erect gas burners, which, by means of branches connected with the main, may receive a copious supply of gas when a signal is required to be made, but at other times will burn with a constant feeble flame." The gas instead of being constantly burning may be ignited at the moment a signal is required, either by an oil lamp, " or other means of a self-acting nature, might, if desired, be employed.

[Printed, 4d. No Drawings.]

A.D. 1853, December 9,—N° 2868.

CHISHOLM, JOHN.—“Improvements in the distillation of
“organic substances and in obtaining products therefrom.”
These are, in reference to this subject, as follows:—“In distilling
“animal and vegetable bodies mixed with salts of lime, potassa,
“or soda, so as to obtain cyanogen compounds,” using close
vessels as retorts now used for coal gas “or a furnace so con-
“structed that a stream of atmospheric air highly heated and
“deprived of its oxygen is made to pass through one or more
“chambers charged with organic bodies, such as fish or animal
“offal so mixed,” or organic bodies mixed with the requisite
alkalies are distilled in a retort by passing steam through it “at
“so high a temperature that it will decompose and carbonize the
“organic bodies.” In distilling the mixture “in connexion with
“the retort an apparatus is to be attached similar to that now in
“use for the manufacture of gas from coal. The gases escaping
“from the retort will be made to pass through one or more
“vessels called purifiers such vessels must be charged with any of
“the well-known chemicals in use for arresting ammonia, such
“as chloride of calcium or sulphate of lime, or solutions of
“sulphuric or hydrochloric acid, or bones finely ground that
“have been mixed with half their weight of sulphuric acid.”
“The gas after being deprived of its ammonia will possess con-
“siderable heating and illuminating power and may be conducted
“to and burned in the furnaces or received in a gas holder for
“the purpose of light.”

[Printed, *et al.* No Drawings.]

A.D. 1853, December 16,—N° 2929.

NORRIS, STEPHEN.—(*Provisional protection only.*)—“Improve-
“ments in lighting and extinguishing gas lamps.”

These are, first, constructing the bottoms of gas lamps with a
hinged piece of glass, to enable instruments to be introduced into
the interior of the lamps for the above purposes; and, second,
employing a portable instrument in which a lighted lamp is placed,
and the use thereof with “certain parts which are attached to the
“gas burner which is inside the lamp” for the above purposes.
A peculiar feature of this invention consists in attaching to the
gas burner a piece of metal in which holes are formed for inserting
a stop pin into one of these holes, for regulating the extent to
which the cock shall be opened. The turning of the cock is

effected by affixing a lever upon the square part of the cock, and by an instrument introduced into the lamp, pushing against the lever on the cock in one direction, the cock will be opened and the gas escape, and is lighted by the flame of the gas lighting instrument; and the extinguishing of the gas may be effected by pushing the lever upon the cock in an opposite direction; or the extinguishing may be effected by placing within the gas burner near the cock a wheel with vanes, which, acted upon by the gas, impart motion to the wheel; on the outer end of the axis of this wheel a small drum is fixed, to which one end of a cord or chain is fixed, the other end of the "cord or chain being fixed to another " similar drum placed below the other one, and when the gas is " first lighted the cord or chain is all wound upon the lower " drum," and as the gas passes through the burner "the upper " drum receives rotary motion, and unwinds the cord or chain " from the lower drum on to the upper one." To burn the gas " for any determined length of time the speed of the upper drum " is so arranged and adjusted as that by the time the cord or " chain is all wound thereon it engages a piece of mechanism " which operates upon the cock so as to shut it off," and then, by means of a spring or otherwise, "the lever upon the cock is " again placed in the proper position for the cock to be again " opened for lighting the gas as before stated."

[Printed, 4d. No Drawings.]

A.D. 1854, January 28.—N° 218.

REDGRAVE, WILLIAM, and REDGRAVE, THOMAS.—(*Provisional protection only.*)—"Railway signal lights."

It is proposed to lay down gas pipes and erect lamps at every quarter of a mile along the line of railway. The lamps are to be framed with two compartments, a lower and an upper one, to be perfectly dark, and so to arrange the parts that when a stop-cock is turned, a small jet of gas which is continually burning in the dark or lower compartment of the lamp, is thrown up in a most brilliant light into the upper compartment where the red bull's eyes are fixed.

[Printed, 4d. No Drawings.]

A.D. 1855, January 23.—N° 177.

PETTIT, GEORGE BROOKS, and SMITH, HENRY FLY.—
"Causing the products of combustion from a gas jet to pass, by

“ means of a recurved pipe or other contrivance, either into the
“ primary or any other gas flame, the effect of which is to change
“ the colour of the flame from white to blue (showing more
“ perfect combustion), and to prevent both unpleasant smell and
“ deposit of soot.”

2. “ We also improve the appearance of gas stoves by the in-
“ sertion in their outer cases of plates of moulded glass or
“ earthenware of unequal thickness with jets of gas behind them,
“ in order to give the appearance of a coal fire or ornamental
“ device.”

3. “ Getting rid of the products resulting from burning gas
“ by carrying them through a coal or other fire.”

[Printed, &c. Drawing.]

A.D. 1855, January 24.—N^o 178.

LAMING, RICHARD.—“ Improvements in obtaining and com-
“ bining ammonia.” These are, in reference to this subject, as
follows :—“ The extraction of ammonia from coal gas by the use
“ of pierced and plane shelves or diaphragms, so combined in
“ pairs with a purifying vessel that while the former serve by their
“ holes to distribute the gas through the mass of purifying liquid,
“ the latter serve by their resisting surfaces to prolong the submer-
“ sion of the subdivided gas without a corresponding increase in
“ the depth of the purifying liquid.” This invention is said to
“ be an improvement upon an apparatus described in No. 582, A.D.
1854, and consists in adding to each of the shelves or diaphragms
in that machine “ a somewhat smaller diaphragm, unpierced with
“ small holes,” which is fixed horizontally about an inch above it
to make the gas after it has ascended through the holes in the
under diaphragms, pass horizontally along the under surfaces of
the blank diaphragms before it can emerge from the liquid used
to purify the gas, that liquid being maintained at a proper depth
by elevating the upper orifice of the pipes by which it has to
descend about half an inch above the level of the unpierced dia-
phragms. The gas may be allowed to escape from between each
two associated diaphragms at every part of the edge of the upper
one, or at certain parts only. “ Also the extraction of ammonia
“ from coal gas by the use of pierced shelves or diaphragms in
“ purifiers fitted with valves,” with spreading heads, instead of
“ or in addition to the second unpierced diaphragms.” Water,

gas liquor, or other ammoniacal liquor is, is by preference, introduced in a small continuous stream into this apparatus, sometimes using ammoniacal liquor on the lower diaphragms, and water in the upper.

[Printed, 4d. No Drawings.]

A.D. 1855, May 12.—N° 1072.

ADAMS, WILLIAM BRIDGES.—“Improvements in the construction and propulsion of vessels for navigation moved by internal power.” These are, in reference to this subject, first, a “signal light to be used at night or in fogs,” by means of “a powerful gas light forming lambent jets of strong flame round the head of the chimney, or in other conspicuous parts. This gas may be produced from retorts in the furnace; but I prefer to produce it by placing a pipe of metal in a furnace heated to such a degree that oil or fat dropped into it in small portions will be flashed into gas, and, ascending inside or outside the chimney in a connected pipe, will communicate with the ring or head of jets, and the heat in the chimney may make the lighting a self-acting process, and the flame can be extinguished by stopping the flow of oil or fat. This gas may also be used for lighting the binnacle, and for other purposes.”

Second, “a signal for sound to be used in fogs, is formed by the application of an air pump worked by the engine, which condenses air or gas into a strong receiver of sufficient capacity, and which condensed air or gas may be discharged continuously into a gigantic trumpet or other instrument made to vary its sound by means of an apparatus similar to the governor of a steam engine, but made to work irregularly if required.” This chamber will serve also for “discharging a continuous shower of shot from a swivel or other gun or guns.”

[Printed, 1s. Drawing.]

A.D. 1855, May 21.—N° 1126.

STAINTON, ROBERT JOHN, and DAVEY, EDMUND CHARLES.—Constructing a stove with a cylindrical chamber in its centre for the reception of coal; at the bottom of this chamber a grating is placed, at which the coal burns; the smoke passes up two lateral pipes, then down close to the fuel box, and out at a pipe about half way down the stove; the fuel chamber being close,

the coal does not burn except at the bottom ; as it burns away, the coal above falls down.

Gas stoves are constructed in a similar form, except that the centre compartment which contains coal is a straight passage, up which air passes and heats the room where the stove is placed.

[Printed, *8d.* Drawings.]

A.D. 1856, December 16.—N° 2975.

AUSTIN, WILLIAM.—“Improvements in pipes or tubes, and “ in the method of joining and laying the same.” These are first, the construction of the extremities of each length of pipe alike or with their ends so shaped that by simply reversing the pipes, “they will follow each other and form a continuous “ tube, whatever may be the configuration of the interior or “ exterior of such pipes, or of whatever known material they “ may be made,” so that any piece of tube may be taken up without disturbing or injuring it, or the adjoining pipes.

Second, “the combination of taper clips or sockets with such “ pipes with the interposition of packing (elastic or otherwise) “ between the pipes and sockets.” The application “of taper “ sockets to the junctions of iron pipes for the conveyance of “ water, gas, steam, &c., insures a firm and secure joint, which “ can at any time be tightened by driving up the collar on the “ packing and compressing it, and relieved by simply driving “ back the collar to admit of a single pipe being removed for “ repair or otherwise.”

[Printed, *6d.* Drawing.]

A.D. 1857, April 20.—N° 1109.

THOMSON, WILLIAM.—Improvements in gas stoves.

The stove consists of a vertical cylinder or pillar, at the bottom of which is placed the gas burner, and over the burner an inner cylinder containing water. The products of combustion rise through spiral pipes, which pass through the body of the water and escape at the top to the chimney. Within the water chamber is a third cylinder, closed at the bottom and open at the top. It is supplied with fresh air by a pipe which enters the bottom at one side ; the air is allowed to escape above into the apartment.

[Printed, *8d.* Drawing.]

A.D. 1857, October 15.—N° 2639.

RICHARDSON, THOMAS, and PRENTICE, MANNING.—“Improvements in the manufacture of salts and preparations of phosphoric acid.” These are, in reference to this subject as follows:—Carbonates of lime and magnesia are, by preference, separated from coprolites by “first calcining the coprolites so as to render caustic the lime and magnesia, which are then removed by treating the calcined matter with water,” and adding to the substance to be treated “a sufficient quantity of sulphuric acid to liberate all the phosphoric acid,” and allowing “the mixture to subside until all the sulphate of lime formed is deposited. Decanting off the clear fluid, adding a portion of the prepared coprolite or other substance containing phosphate of lime, and evaporate the mixture to dryness, or to other desired extent.”

Or the solution of phosphoric acid may be evaporated nearly to dryness, and the drying up “by means of sawdust, cob, or cosh malt chives, or other similar materials, which material may be used as manure in the place of ordinary superphosphate of lime, or the phosphoric acid it contains may be neutralized by ammonia by exposing it on perforated trays or shelves in the purifiers ordinarily at work in gas works, or otherwise, and used as a manure.”

[Printed, 8d. Drawing.]

A.D. 1858, June 3.—N° 1247.

BETHELL, JOHN.—“Improvements in the manufacture of alum.” These are, “getting the necessary ammonia from gas for the purpose of making alum,” and “in using the liquid sulphate of ammonia so obtained from gas for making alum” as follows:—“Take weak sulphuric acid or sulphuric acid and water, and put it in a closed tank and cause the gas from coal or any other gas containing ammonia to pass through the liquid until the sulphuric acid is saturated with ammonia,” and to this solution of sulphate of ammonia add “a solution of sulphate of alumina and proceed to make alum by evaporation and crystallization in the usual way.” “The closed tank above named may be the usual purifier at the coal gas works.”

The same effect may be produced by passing the gas through purifiers in which are “small pieces of coke or other substances” moistened with weak sulphuric acid, and when the acid is satu-

rated with ammonia the pieces of coke, &c. are taken out and washed, and sulphate of alumina is added to the sulphate of ammonia, and alum is made as before.

[Printed, 4d. No Drawings.]

A.D. 1858, July 26.—N^o 1677.

COOKE, JAMES.—“Improvements in singeing, treating, or “finishing textile fabrics.” These are, first, the general arrangement and construction of machinery or apparatus.

Second, the system or mode of treating or finishing textile fabrics by means of singeing or gassing apparatus arranged.

Third, using and applying a current of heated air for the above purpose, so as to cause the same to impinge upon or become mixed with the gas as it issues from the burners.

Fourth, the system or mode of using heated gas or air, either separate or combined, in the above operation.

Fifth, arranging the gas burners so as to be made to move upon centres.

Sixth, returning the heated air and unconsumed products of combustion again to the burners.

“These burners are made of a T-shaped figure, the horizontal tube at the upper part being closed at each end, and a row of perforations is made along the upper part for the emission of the gas.” The gas supply pipe is tapped into one of the ends of the end bosses of the horizontal pipe, the passage of the gas, is controlled by a cock fitted in the supply pipe. The horizontal pipe has a handle at one end, by which the burners “may be placed in a vertical or angular position, so that the burners “may be removed aside and out of the way while the ‘leader’ “is being carried through the machine preparatory to commencing the singeing process.” To convey away the products of combustion, in preference, a throttle valve is fitted in the passage pipe; between this valve and a fan a pipe branches off laterally, which is carried backwards along the side of the machine; this pipe communicates by means of a cock or valve with the main gas pipe. From the air pipe four vertical tubes descend, which convey the combined stream of heated air and gas to the air distributors, from whence it impinges upon the flame.

Seventh, the use “of round or polygonal singeing rollers for “passing the goods or fabrics over during the gassing and “singeing.”

Eighth, **arranging** the tension or guide rollers, so that either one or both sides of the fabric may be gassed or singed as required.

Ninth, "the use and application of smoothing rollers for taking the creases out of the fabrics to be gassed or singed; also the application of rotatory brushes or cards arranged in such machinery."

Tenth, "regulating the tension upon the fabrics as they pass through the machine by frictional brake apparatus."

Eleventh, regulating the speed of the fabrics as they pass through the machine by means of the mechanical arrangement which equalizes the motion of the winding-on beam.

[Printed, 1s. 2d. Drawings.]

A.D. 1858, October 8.—N^o 2242.

ROBERTS, THOMAS, and DALE, JOHN.—"An improved process for obtaining salts of soda and other alkalies." These are, in reference to this subject, in the production of "arseniate of ammonia by using arsenic acid for the purpose of the purification of coal gas from ammonia." Another method is given for obtaining arseniate of ammonia, although it does not belong to this subject, it is, adding to crude gas liquor "so much of a solution of arsenic acid as shall be sufficient to form such arseniate of ammonia as shall be required." The remainder of the processes are producing "nitrite, arseniate, and stannate of soda or other alkalies."

[Printed, 4d. No Drawings.]

A.D. 1858, November 24.—N^o 2669.

NIBBS, JAMES SYSON.—"Improvements in lighting, heating, and ventilating." These are, in reference to this subject, first, the construction of ventilators for gas lamps and their application to gas stoves "for the purpose of diffusing heat, or carrying off impure vapours." A thin metal cylinder is made to taper gradually towards the upper part where the edge is turned outwards, a metal diaphragm is fitted within the cylinder towards its upper part; this diaphragm has a series of openings or slots made in it, extending round the outer portion of the diaphragm. The current of heated air passing off from the stove or lamp strikes against the diaphragm, and escapes through the radial slots, and

passes upwards into the dome or cap, fixed on the top of the cylinder. The cap is fitted to the angularly disposed perforated plate or windguard, which is made to fit the taper cylinder. The heated air passes downwards, and away out by the triangular openings in the wind guard. The apertures in the wind guard "are made so that the metal which is cut through on two sides of the triangle forms an inwardly projecting vane."

Second, a reflector which may be "advantageously applied for reflecting or throwing forward the heat arising from gas and other stoves or fire grates," "composed of an oblong-shaped piece of metal, bent or otherwise formed into a segmental figure made up of a series of planes or reflecting surfaces," and "fitted in the usual way to the back of the interior of the lamp."

[Printed, 1s. Drawings.]

A.D. 1861, May 16.—N^o 1248.

BOWDITCH, WILLIAM RENWICK.—"Improvements in safety " and other lamps." These are, in reference to this subject, cooking lamps fed with gas by means of a metallic peg kept in its place by a spring to which it is fixed. The spring is fastened to the lamp, so that a metallic stop upon the ring which fastens the wire gauze for enclosing the light slides up and over the spring at each turn of the screw, which attaches the wire gauze to the body of the lamp. When the stop has passed over the spring the spring is released, and if an attempt be made to unscrew the top of the lamp, the stop presses against the spring. To depress this spring and set the cover of the lamp free, a rod is used, which passes upwards through the bottom of the lamp, and of which, when drawn down a projecting part acts on the spring, and at the same time brings down a metallic plate or extinguisher, which puts out the light. Gauze or perforated metal cylinders are fastened to the bottom of the lamp by screws, and they may be about an inch and a quarter deep, and one "should be from half to three quarters of an inch greater in diameter than the other, so as to leave a space of not less than a quarter of an inch between them" and preferably the bottom of these cylinders is closed by a metallic plate. Also placing "strips of metal vertically between and touching the two lower gauze or perforated metallic cylinders through which air passes to the burners, in order to convey heat from the inner to the outer, and such outer covering may have

" attached to it open metal work, similar to the strips already described to abstract heat from it, and cool it more rapidly than the air would do without such external metallic work."

[Printed, 8d. Drawing.]

A.D. 1861, May 21.—N° 1291.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from J. B. Lacril.*)—"Improvements in the coupling or connecting joints or pipes for the conveyance of liquid, fluid, or solid bodies." These are "the construction and application to gas, water, air, and other pipes, of an elastic and compensating or stuffing box joint composed of isolated parts arranged and secured" substantially as follows:—"The extremity of a pipe is provided with a projecting edge, in the centre of which is formed a groove or chamber, filled with a vulcanized caoutchouc washer; a second chamber is formed in the overlapping extremity of a second pipe, on which are cast two ear pieces traversed by a wrought-iron bolt. On the first pipe slides a moveable ring carrying two pierced ear pieces. A similar set of ear pieces and pressure bolt are mounted on the opposite diameter of the pipes, and at such other points of the circumference as may be rendered necessary by the dimensions of the latter. To close the joint, the bolts are passed through holes in the first and second pipes, and are screwed down by two nuts, during which process the movable ring being drawn forward compresses the caoutchouc washer in the chambers of the first and second pipe. The arrangement of the different working parts of the joints may be varied; as in replacing the pressure bolts by key pieces adjusted in corresponding ears or projections suitably distributed. The chambers in which the caoutchouc is lodged may be grooved to a conical circular, oval, &c. form.

In certain cases the caoutchouc may be replaced by gutta percha, tow, bitumen, &c.

[Printed, 10d. Drawings.]

A.D. 1861, November 5.—N° 2773.

LIVESEY, JAMES.—(*Provisional protection only.*)—"Improvements in apparatus for communicating from one part of a railway train to another, and for coupling pipes." In carrying out the above, it is said, "the pipes may be coupled in any

“ convenient manner, or by a socket lined with india rubber or
“ other suitable yielding material into which a bush with a slightly
“ enlarged end fits. This improved coupling may be used for
“ connecting gas and other pipes; the advantage it possesses over
“ other couplings is, that it can instantly be connected and
“ disconnected.”

[Printed, 4d. No Drawings.]

A.D. 1862, February 11.—N^o 360.

LINDEMANN, GUSTAV.—“ Improvements in applying gas for
“ the purpose of singeing or dressing yarns or threads and woven
“ fabrics, and for obtaining heat for other purposes.” These are
said to be “ the use of a revolving burner or burners.” In singeing or dressing woven fabrics the material is made to pass through a chamber in which is a hollow cylinder the periphery of which is provided with a number of slits upon which the gas burners are mounted; one end of the axis of the revolving cylinder turns in a bearing the other end is hollow and turns likewise in a bearing, beyond which the axis extends and passes into a stuffing box provided with a gas supply pipe. Upon the axis of the revolving cylinder is a small pulley driven by a band from a shaft above “ and thus a rotatory flame is produced.” In drying fabrics, a cylinder of wire gauze or other such material, carrying the fabric to be dried, revolves by any arrangement within a cylindrical casing; in the centre of this arrangement are the revolving burners formed on long slots upon pipes. The heat which is generated passes through the gauze cylinder and fabric to be dried, escaping finally through a chimney on the upper part of the cylinder. A similar sort of arrangement of revolving burners is employed for evaporating liquids.

[Printed, 8d. Drawing.]

A.D. 1862, February 25.—N^o 513.

GUYET, PIERRE JOSEPH.—(*Provisional protection only.*)—
“ An improved coupling for uniting pipes between locomotives
“ and tenders, applicable also to the coupling of other pipes.”
Among the other pipes which are named are gas. Two pipes are connected by a coupling box, the internal diameter of which is

larger than the outside of the two pipes. The connecting joints are made by two india-rubber rings lodged some distance apart inside the coupling box and compressed between its two flanges, one at each end. Over each of the india-rubber rings is a conical cover secured by bolts to the coupling box.

[Printed, 8d. Drawing.]

A.D. 1862, June 14.—N° 1774.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Charles Claude Philibert Nicolas Pernolet.*)—"Improvements in coking ovens, in collecting and utilizing the products resulting from the distillation or carbonization of coal and other matters producing coke, and in apparatus employed therein." It is stated "if these ovens are erected near towns and populous places the gas can be used for lighting, or it may be employed in iron works, where a quick, pure, and regular fire is required." The coke ovens are oblong, each capable of holding six truck loads; at each end are doors or stoppers which are raised and lowered by a travelling windlass. The materials to be distilled are fed into the ovens at the top by two apertures which are afterwards closed by doors, the joints of which are made tight by sand or earth. The products of distillation issue from an orifice in the top, traverse through passages, and enter the condenser, consisting of compartments formed of thin metallic plates, smooth and close to one another, by which it is gradually cooled. The cooling is accelerated by a continuous flow of water from a reservoir above. The tar and the greater portion of the ammoniacal waters become deposited in two troughs below. The gases and ammoniacal vapours enter into the first washer where they traverse from bottom upwards through fine showers of ammoniacal water supplied continually by a pump and reservoir. The gas passes to a second washer similar to the first, but "supplied with water only, to complete the absorption of the ammoniacal matters."

[Printed, 1s. Drawings.]

A.D. 1862, July 28.—N° 2128.

BOLLINGER, HENRY.—"Improvements in machines employed in ship-building, part of which are also applicable to other purposes." This consists, in reference to this subject, in a machine which may be used for exhausting gas, consisting of

a bed plate on which is mounted "a column or pipe, to which the piston is cast or fixed. The cylinder is fitted to the piston and has reciprocating motion imparted to it by cranks and connecting rods. The column or pipe serves as inlet and outlet, and contains a valve having an alternate revolving motion imparted to it by a cam or other contrivance. In the valve are openings which correspond with similar openings through the pipe and piston, one half of which communicate with the space above the piston, and the other half with the space below." This apparatus may be "worked by hand or motive power."

[Printed, 3s. Drawings.]

A.D. 1862, September 24.—N^o 2609.

UPFILL; WILLIAM, and ASBURY, WILLIAM.—"Improvements in the manufacture of metallic bedsteads, part of which improvements are also applicable for ornamenting tubes and curtain and cornice poles." This mode of ornamenting it is said may be applied to gas and other standards. "A common iron tube japanned or painted and covered with perforated metal." "A tubular gas pillar ornamented by means of a perforated tube, and paper or other lining placed over the inner tube." "The ornamental colours which are intended to show through the perforations of the outer tube are produced either by painting or japanning the inner tube."

[Printed, 10d. Drawing.]

A.D. 1863, February 24.—N^o 512.

THOMSON, ROBERT WILLIAM.—"Improvements in obtaining and applying motive power, which improvements or parts thereof are applicable for raising, forcing, and measuring fluids."

A "rotary steam engine, which consists of a cylinder or steam chamber with a horizontal axis, containing within it two diaphragms or pistons," one of which "is keyed upon a solid shaft passing through the axial line of the cylinder, whilst the other is similarly keyed upon or attached to a tubular or hollow shaft, through which the solid shaft is passed. The hollow or tubular shaft passes out of one end of the steam cylinder by a

“ stuffing box in the ordinary manner, and the solid shaft passes through it. Each shaft has keyed upon it a working crank, and these two cranks have connecting rods, the opposite ends of which are jointed to the rim of a fly wheel disposed eccentrically as regards the steam cylinder by means of suitable jointed studs. The positions of the pistons accord with those of the external cranks, and the actuating steam is admitted to one side of the diaphragms, and discharged on the other by valves of any suitable form. At the ‘dead point’ of the engine the two pistons or diaphragms themselves close the steam cylinder ports.” “This rotatory engine may be so arranged as to dispense with slide valves, the pistons being made available to open and shut the steam ports at the proper intervals.” In another arrangement of the engine “the crank pins before referred to, instead of being connected to the fly wheel by rods, are made to enter slides which traverse to and fro in a slot formed in a box extending across the face of the fly wheel.” In place of this arrangement, “the differential movement may be obtained by means of a system of eccentric elliptical wheels gearing together.” The above engines or modifications of the same, may, among several applications which are named, be used “for exhausting gas from retorts and forcing it into gasometers.”

[Printed, 1s. 6d. Drawings.]

A.D. 1863, June 25.—No 1597.

RIPLEY, ABRAHAM. — “Improvements in the method and construction of a packing chiefly applicable to piston rods, pumps, and such like, and for forming the joints of gas, steam, or water pipes.” These are, forming a packing cord the interior of which is composed, in preference, of “several yarns of soft spun hemp, but other porous fibrous material may be used in place thereof or combined therewith” which are “saturated with oil, tallow, or other suitable lubricant” and coated with wire, in preference, of brass “or wire formed of other alloy of copper or zinc, but wire of other metal may be used, and it is also preferred that the whole weaving should be of wire, but yarns of fibrous material may be used therewith.”

[Printed, 4d. No Drawings.]

A.D. 1863, November 16.—N^o 2865.

CAMERON, SAMUEL, and JOHNSTON, WILLIAM.—“Improvements in taps or valves, in pipe joints, and in the valvular mechanism of water-closets.” In describing various taps, valves, &c. a tap is described the body or shell of which is in three pieces, the middle piece being formed on the inlet and on each side thereof, and between it and the top and bottom pieces, are washers of leather or rubber which are held, and have their inner edges projecting slightly into a cylindrical valve chamber, in which there is a hollow cylindrical valve piece, this valve piece has holes in its side, and when these holes are between the washers the fluid has access to the valve piece and is discharged through it, but when the valve piece is shifted with holes outside of the washers, the fluid is shut off by them. In this example the movement of the valve piece, is obtained by means of a screw handle. “The valve piece in this and the other modifications, and more particularly when of large size, may be economically made of an outer shell of thin metal, such as drawn brass tubing, upon an inner shell of cast iron or other cheap material.” “Pipe joints such as the swivel joints of gas brackets, particularly when of comparatively large size, may be advantageously made in the same way,” the journal of the swinging pipe being held like the tap plug between two half bearings. Or the reverse arrangement may be adopted, the movable discharge tube being formed with the two-half bearings, which work on the plug, whilst the plug forms a continuation of the inlet piece, and has a flanged continuation by which it may be additionally fixed. “When of large size the pipe joints are made of cast iron electro-bronzed.”

[Printed, 10d. Drawing.]

A.D. 1864, May 9.—N^o 1172.

AITKEN, HENRY.—“Improvements in the system or mode of calcining and extracting the oils and gases from ironstone and other materials, and in apparatus or means employed therefor.” These are, employing “a large inclined flue or duct through which the substance to be calcined passes,” in preference made of fire brick. In the upper portion are two openings for charging the kiln, which are closed by tight doors luted with clay or other

material. In the upper inclined face of the kiln are several openings with short upright necks made of fire-clay or other fire-resisting material, and from the upper portions of these extend pipes or ducts which are carried over, and their further ends secured to the top of another large duct, the gases being driven off either "by the heat generated in the calcining, or from the heat of the outside fires, are carried to suitable vessels, where they are condensed and rendered fit for use; or if suitable the gas may be pumped into chambers and rendered available as gas; or whatever gases may be considered useless may be carried off by a chimney."

[Printed, 1s. 4d. Drawings.]

A.D. 1864, July 27.—N° 1876.

CHAMBEYRON, JEAN PIERRE.—"Certain improvements in the manufacture of steel." These are in the "manufacture of steel by cementing iron." The cementation takes place in a series of retorts made of fire-proof clay and capable of resisting a considerable pressure. The gases "are obtained by the dry distillation of the animal or proteic substances such as the wastes of wool and silk, old leather, horsehair, horns, dessicated blood, and flock, and other similar substances, provided they do not contain any phosphates." The water in these substances is driven off by calcining in a dessicating stove, they are then mixed up together, mechanically divided, and finally mixed with molasses to cause them to adhere to the metal; when the things are placed in the retorts. "The first gases will be lighted, and will cause some crackling until the watery vapours are fully consumed. Then their escape will be stopped and the cementation will begin. The cementing substances must be put in excess in order to obtain the utmost pressure." The gases are put in continuous circulation by means of an air pump, and when the pressure is excessive they "will pass into a conduit in connection with the cylinder enveloping the valve, and thence they will reach the gasometer into which they are to be collected. A similar collection of the gases will take place after the cementation." The gases lessened in richness by use are restored "by distilling into them some substances full of azote and carbon, such as the essential oils, deteriorated flour

“ containing azoto-carburetted substances, and I distil them in a
“ special apparatus.” “ The gases will be sent by means of a
“ machine into the cementing retorts, and they will be withdrawn
“ from them when necessary.” In some cases the gasometer will
be replaced by a cylinder.

[Printed, 10d. Drawings.]

A.D. 1864, October 25.—N° 2641.

TAYLOR, EDWARD HENRY.—(*Provisional protection only.*)—

“ Improved apparatus for drawing-off or emptying the contents
“ of casks, ships’ tanks, and other vessels containing petroleum,
“ paraffin, and other matters or liquids, and also the application
“ of similar apparatus for the supply and stoppage of air.” “ To
“ the end, side, or other part of the vessel I fix a flange and
“ tube” by any means; this “ tube projects into the interior of
“ the vessel, and its interior is screwed as a nut. Into this
“ screwed part of the tube, I screw a tubular plug open at the
“ front and closed at the back, there being in the body of the
“ plug near the back a number of perforations, and at the front
“ end two or more notches or recesses. The end part of the
“ discharge tap or pipe is screwed to correspond with the interior
“ of the tube fixed to the vessel, and its extreme end has two or
“ more projections corresponding with the aforesaid notches in
“ the plug, and when the contents of the vessel have to be with-
“ drawn the projections are entered into the notches, and the end
“ of the tap or pipe screwed into the tube, and as the projections
“ and notches move together the plug is unscrewed from the
“ tube, thereby allowing the perforations to be open to the con-
“ tents of the vessel, which then escape through the interior of
“ the plug to the tap or pipe. When the tap or pipe is required
“ to be removed it is unscrewed from the tube, and at the same
“ time it turns the plug, and draws it into the tube, and closes
“ the perforations, so as to make the vessel perfectly tight, and
“ thus prevent leakage. For supplying and shutting off air to
“ the vessels I use vents formed in a similar manner, the pipe
“ having the projections being connected to a valve or tap.
“ Similar apparatus is also applicable to the mains of water and
“ gas pipes.”

[Printed, 4d. No Drawings.]

A.D. 1865, October 2.—N° 2527.

SALISBURY, SILAS COVELL.—"Improvements in producing " and combining gases to be used for heating purposes, and in " the construction of retorts for producing and combining such " gases." These are placing in an ordinary furnace a retort shaped somewhat like a muffle shorter than the grate bars on which it rests; one or a number of such retorts may be used. They are three to six inches broad, and there is "room between " and around them for sufficient coal to keep such retorts highly " heated." An opening from half an inch to an inch wide extends the whole length of the top of the retort, in which is fitted a corrugated or fluted valve plate covering the opening, but allowing gases to escape. Two hollow tubes or evaporating pans are in the bottom of the retort, one of which is supplied with petroleum and the other with water from reservoirs fixed above, regulated and governed by suitable gauge cocks. The upper sides of such tubes are perforated with small holes to permit the gases generated therein to pass freely into the retort. To this retort is also attached a blower to furnish a continuous blast with uniform pressure. In the upper part of the retort and below the corrugated or fluted valve plate are placed a number of iron rods or small tubes extending the length of the retort. Another kind of retort for the combination of such gases consists of two hollow tubes, one placed within the other and properly secured. In the upper side of the inner tube are a series of small holes, furnishing communication between such tube and the one enclosing it, and through each side of and near the top of the outer tube are similar holes, furnishing communication between such tube and the fire of the furnace. The inner tubes, if a number are used, connect with and open into one of the cross or end tubes to which is supplied petroleum or other hydro-carbon oil from a reservoir. The outer tubes connect with the cross or end tube to which water is supplied from a reservoir. Another mode of carrying out the above is described.

[Printed, 10d. Drawing.]

A.D. 1866, February 1.—N° 316.

MACINTOSH, JOHN, and BOGGETT, WILLIAM.—(*Provisional protection only.*)—"Improvements in gas pipes." These are with

a view to prevent leakage from cast-iron pipes substituting for the same glass pipes, or inserting glass cylinders into the iron pipes, "by way of lining, or they may be coated internally with "liquid glass," or "with collodion, either by itself or combined "with glue or other gelatinous or albuminous substances in "conjunction, when requisite, with canvas, paper, or other textile "or fibrous materials;" also "by the use of shellac or a com- "pound of shellac known as marine glue, or the interior of the "pipes may be tinned, or coated with enamel."

[Printed, 4d. No Drawings.]

A.D. 1866, February 7.—N^o 370.

PRICE, EDWARD.—"Improvements in barrows, carts, trucks, "or other vehicles." These vehicles, it is said, are "specially "adapted for the removal of coke from the retorts in gas works," and they are constructed as follows:—"The body of the vehicle "is mounted on a spindle or an axle tree with one, two, or more "wheels, and is divided into two parts, the part next the shafts "being fixed to the frame," and the other, the moveable, capable of being turned upside down by working on hinges or joints, "formed by bolts passing through eyes made with flaps, and "fastened on each of both parts of the vehicle at the top directly "over the axle tree, this being the only connection of the two "parts." The moveable part is in the form of a quadrant, and is raised "by means of a bar passing along the top of the right- "hand side of the vehicle, but to be fastened to the moveable "part only," thus forming a lever, "whose fulcrum is at a point "near the right hinge," to "which lever at the end nearest the "shaft is joined a handle made to double upon the lever and lie "on it when not in use, but to be raised into a position at right "angles with the lever when about to be used, and within reach "of the man working it, who by pulling the handle towards him "with a downward pressure operates upon the lever, raises the "front part of the vehicle, and forms the opening at the bottom "to rid it of its load." "In order to facilitate the discharge of "the load the bottom of the back part next the shafts (being the "fixed part) is made to slope from the top of the frame to the "point of discharge at the bottom so that when the separation "of the parts takes place accompanied with a slight lift or jerk

" of the shafts with the left hand, the load falls out easily of its own gravity."

[Printed, 8d. Drawing.]

A.D. 1866, March 3.—N° 642.

LARNAUDES, VICTOR.—"A new or improved chemical mixture to be used as a disinfecting and preserving fluid for the cure of disease among cattle, and for other purposes." This "consists of the following ingredients in or about" the following proportions, "natural water 100 lbs., sulphate of zinc $26\frac{1}{2}$ lbs., sulphate of copper 8 ounces." To purify gas is among the purposes named to which this chemical mixture, it is said, may be applied, and by placing it "in the meter in lieu of the common water" the advantage is, 1st, that all bad smell is prevented; and 2ndly, that the fluid will not freeze at any temperature. If preferred the fluid may be contained in a vessel detached from the meter, and the gas be made to pass through the same."

[Printed, 4d. No Drawings.]

A.D. 1866, March 29.—N° 919.

PARDOE, CHARLES.—"Improvements in the construction of coke ovens." These are "making in the partition or side walls of a series or group of ovens side flues, which side flues open at top into the coke ovens, and at bottom into flues underneath the bottom of the series or group of ovens" and for the purpose of making either coal oils or combustible or lighting gas, making every alternate coke oven into a retort or closed chamber, and heat the said retorts or chambers by the flames and products of combustion passing from the adjacent coke ovens. In this case the ovens in which coke only is to be made are provided with openings at either side which open into the side flues. In the middle of the chambers or retorts is a flue or passage for conveying away the hydro-carbon vapours or gases generated in the said retorts or chambers to a condensing apparatus of the ordinary kind.

[Printed, 10d. Drawing.]

A.D. 1866, May 8.—N° 1320.

NORTON, JAMES LEE, and GILES, ALFRED.—“Improvements
“in apparatus to be employed in evaporating volatile and com-
“bustible liquids to obtain light or heat therefrom.” These
are, employing “a close vessel, to the lower part of which the
“combustible liquid,” which “is the more volatile portions of
“the earth oil of the United States and other places” and “has
“a specific gravity of about 670; in fact the lighter the better;”
is distributed “either by a bird fountain arrangement or other
“means.” “In the close vessel is a moving surface, which is
“kept moistened by the liquid, in preference,” in the form of a
drum covered with wire gauze in one or more layers, the drum
dips into the liquid at the bottom of the containing vessel, and is
caused to revolve; “it thus takes up the liquid, so that its
“surface is constantly kept moist.” Atmospheric air under
pressure, in preference, by a weighted bag or gasholder, is led
into the interior of the drum through the hollow axis of same,
“becomes charged with vapour and it is then by a suitable
“passage led away from the close vessel to the burner where it
“is to be burnt to obtain light or heat,” or mechanism like a
gas meter may be employed for giving motion to the evaporating
drum or surface. Or employing “bellows like an organ bellows,
“driven by a spring or weight or other maintaining power, and
“forcing air, as in an organ into a collapsible air reservoir.” “In
“place of charging atmospheric air with combustible vapour in
“this manner enriching ordinary illuminating gas in a similar
“manner and in this case no compressing apparatus is necessary.”
“When using combustible liquids which do not volatilize very
“readily, the air or gas passing into the evaporating vessel may
“be warmed by means of a small gas burner under the pipe
“through which it passes. Or the evaporating vessel may be
“surrounded with a water or air casing kept warm by a small
“gas burner.” Other modes of distributing the liquid over the
surfaces within the generating vessel are described.

[Printed, 10d. Drawing.]

A.D. 1866, May 18.—N° 1410.

BERNARD, JULIAN.—“Certain improvements in generating
“and heating steam, gas, and vapours, and in the machinery or
“apparatus employed therefor.” These are a series of com-

partments or cells concentric, parallel, or uniform. "In each cell which has its upper end open a circular framing is suspended from a ring or rings, bars, or other means of support which rest on or are fixed to the sides of the upper part of the chamber or cell, and secured into or around the framing or support is a layer or layers of some largely absorbent material. such as rough canvas, felt, or other fabric capable of holding considerable quantities of liquid in suspension. The upper part of each frame is provided with a gutter or tube into which the liquid is continually admitted in such quantities as may be required, and the upper part of the absorbant material is connected to the tube or gutter, thereby obtaining or receiving a continual supply of liquid. Heat is applied to the cells or chambers whose openings are in the lower side or ends of the generator, and the heat is thus very rapidly conducted through the plates forming the sides of each cell to the absorbent materials containing the fluid, which is speedily driven off into vapour. It is preferred to apply atmospheric air in a highly rarified and heated condition, for the purpose of generating the vapour in lieu of applying the heat directly, the air being forced into the generators or heaters by means of a fan, blowing cylinder, or otherwise.

[Printed, 1s. 3d. Drawings.]

A.D. 1866, September 20.—N° 2415.

BÉRARD, ARISTIDE BALTHAZARD.—"Improvements in the manufacture of steel. and in the apparatus employed therefor, parts of which improvements and apparatus are also applicable to the production of gas for heating purposes." These are, in reference to this subject, producing gas as follows:—A furnace, the external case of which is of sheet or cast iron, the inner lining is of refractory brick. The upper opening is provided with a tube in which the charge is placed; two check valves close the lower part of this tube; above the charge is a hydraulic closing; y opening the valves the charge falls into the furnace below, upon bars, which may be hollow, through which air for feeding the gas generator is introduced. Coal is the fuel generally employed, in preference, smiths' coal, but when very rich it is mixed with poor coal or coke to prevent its caking. Wood previously dried and turf may be employed. When the coal "contains sulphur coke or charcoal only may be employed; it is then necessary

"to force to the maximum the employment of over-heated steam," to increase the proportion of hydrogen. This is effected by means of a series of tubes sunk in the masonry, finally delivering the steam through blast pipes a certain height above the grate "where the fuel has acquired by the inflation of air its maximum of temperature." After working sometime the slags produced in the lower part of the furnace are removed, by first forming a temporary grate of pokers or iron bars above the slags, then by the action of a screw jack or other means, the bottom of the grate, which is moveable, is removed, cleared of its clinkers, then put back in its groove in the bottom, lined with clay. The gas passes by a pipe at the upper part of the furnace and may be employed direct, or it may be passed through a purifying apparatus, a box charged with fresh water and "also the reagents for the absorption of the sulphurous or other gases." The water "may contain lime in solution or salts of iron." Dry sesquioxide of iron may also be employed. "The gas after being washed occupies the upper part of the box" and proceeds through a pipe "either to the gasometer or to the place where it is to be used."

[Printed, 1s. 6d. Drawings.]

A.D. 1866, September 24.—N^o 2449.

STODDARD, ARTHUR FRANCIS.—(*Provisional protection only.*)—"A new or improved artificial coal or fuel." This fuel, it is said, "is to be used or employed for the production of gas for lighting, or illuminating purposes generally," and it is made by "mixing the oily, fatty, pitchy, and other residues of shale oil, petroleum, or other mineral oil, after their most valuable gases, spirits, and oils have been abstracted from them by distillation" "with coal and coal dross and 'slack' by preference, in a finely crushed or ground pulverised state as are absorbent," and used in this state, or "by preference, compressed or moulded into small blocks or lumps," with or without heat, by such machinery as is used for the manufacture of artificial fuels and of bricks. "The grinding and mixing of the coal with the said residues of mineral oils may be effected by the mills and other machinery at present used for grinding mixing, and moistening fire-clay and other substances."

[Printed, 4d. No Drawings.]

A.D. 1866, December 5.—N° 3203.

CHUBB, THOMAS JONAS.—“An improved process and furnace
“or apparatus for the manufacture of steel or metal having some
“of the properties of steel.” This consists, in reference to this
subject, of a “novel construction of and principle of working a
“gas heating or a heat regenerating apparatus, whereby the air
“and gas are or may be passed in a direct and continuous
“manner to the combustion chamber through tubes heated
“externally by the waste heat derived from the products of such
“combustion, or, in other words, the air and gas warmed by
“heat passing through the material of which the tubes or pas-
“sages are composed and derived from the circulation of the
“waste heat on or around the opposite sides or surfaces to those
“of such ways or passages with which the air and gas come or
“are brought in contact.” The mould, melting, and carbonizing
chambers are heated by a gas generating and reheating or regene-
rating apparatus, consisting of a fire-place or furnace with “a
“gas passage leading direct therefrom to the regenerator, the
“regenerator or passages leading thereto being furnished with
“valves or dampers for regulating the courses or currents of the
“gas or air, as well understood by those acquainted with the
“working of other regenerating gas furnaces;” but in this
regenerating furnace or apparatus, “dispensing with zig-zag
“plates or large chambers packed with refractory substances,
“and substituting therefor tubes through which the air and
“gases are passed in a direct or continuous manner, while the
“waste heat or gases making up the same are made to circulate
“outside of the said tubes, or the action of these two currents
“reversed as regards their passage through or outside of the
“tubes.”

[Printed, 2s. Drawings.]

SUPPLEMENT B.

A.D. 1814, June 18.—N° 3817.

TINDALL, THOMAS.—“Improvements on the steam engine,
“with appendages thereto, and also a mode of applying the same
“to the driving of all sorts of carriages and machinery, and to a
“variety of other useful purposes.”

A portion of this invention relates to a retort for generating gas from coals, therefore it is included in the present series of Abridgments. This retort is placed within a vessel which is at the end of the boiler of the apparatus, the said vessel serving for "the heated air and combustion to pass up." The round retort is "heated by the surrounding flue from the fire, which extracts the gas from the coals, and conveys the same to a vessel for the reception thereof, either round the vessel where the retort is, or by its side as most convenient." The vessel that surrounds the retort holds water or air, and the gas "is conveyed by a pipe through the water in the said vessel, or into the said vessel with hot air, and from thence through a pipe or pipes, to give lights to where wanted, by fixing a cock at the end of each pipe." The retort can be easily worked, the lid being on the top of the retort and screwed down by a cross bar "into a groove round the retort airtight, so that the coals are put in and cinders taken out as often as needful, to supply the feeder with cinders instead of coals, which will prevent the unpleasantness of smoke." This method is applicable in connection with all kinds of steam engines, with brewing arrangements, and in dwelling houses. In the latter instance, the retort may "be fixed at the back of the kitchen fire;" "if a convenient place, then fix a gas barometer, and convey it to as many rooms as want to be lighted."

[Printed, 1s. 2d. See Rolls Chapel Reports, 7th Report, p. 115.]

A.D. 1827, October 11.—N^o 5553.

HORTON, JOSHUA.—The mode of "forming and making" "retorts and various other hollow and useful articles" in wrought iron, &c. A sufficient number of wrought-iron bars of the whole length of the retort are placed together in the form of a circle, and in this state heated in a suitable furnace or fire, and when heated to the welding point taken out and welded together by the action of a hammer or hammers on a suitable anvil or swedge, with the assistance of a mandril. The ends are formed either by welding them on, or they are screwed on, or by any other well-known means. The retorts are employed for generating gas.

[Printed, 8d. Drawings. See Repertory of Arts, vol. 7 (*third series*), p. 425; London Journal (*Newton's*), vol. 6 (*second series*), p. 334; Register of Arts and Sciences, vol. 3; (*new series*), p. 3; Engineers' and Mechanics' Encyclopedia, vol. 1, p. 311.]

A.D. 1842, October 8.—N° 9487.

DEUTSCHE, CLAUDE EDWARD.—(*A communication.*)—Improvements in combining matters to be used for a number of purposes, among which are named “tubes of every description” for the passage of gas and other fluids.”

Four combinations are described for this purpose. The first is as follows :—A bituminous substance, preferably “bitumen of Trinidad,” is distilled until “the essential oil and water” is driven off, and “when it has arrived at that stage that the condensed water, &c. comes away only in small drops, the bitumen under operation should be removed from the vessel,” and passed through a metallic cloth sieve.

Second. Adding to the above prepared bitumen from one to fifty per cent. of protoxide of lead, or of any other oxide, and mixing them well together.

Third. Adding to the first preparation from one to one hundred per cent. of fatty matters, in preference concrete whale oil. “By adding to these different preparations a quantity of wax, gum resin, resin, sulphur or caoutchouc, I obtain a flexibility and adhesive property more or less according to the quantity of such matters employed.”

Fourth. Taking a quantity of the first preparation, and adding to it a quantity of either one or many of the following vegetable substances, as “caoutchouc, the bedellium copal, rosin lac, or élémi of gum rosin or other rosin, and add thereto a suitable quantity of any essential oil or alcohol, or even oil and alcohol mixed together.”

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 3, (*enlarged series*), p. 299.]

A.D. 1846, March 11.—N° 11,129.

BOVILL, GEORGE HINTON, and GRIFFITHS, ROBERT.—Transmitting gas for lighting railways and other places by means of exhaustion or suction, in contradistinction to the method heretofore adopted by forcing. “In employing suitable gas pipes or mains between the places where it is manufactured, and the place where distributed for use (from a gasometer in the usual way), and causing the pipes or gas main to be continually exhausted at or near the place where the gas is to be delivered,

“ so that the gas will flow freely from the place where it is made
 “ towards the exhausting apparatus, without having to press on
 “ any piston in the gas main or pipe, which when working atmospheric railways is necessary.”

[Printed, 2s. Drawings. See Patent Journal, vol. 1, p. 273.]

A.D. 1846, May 13.—N^o 11,205.

CROLL, ALEXANDER ANGUS.—“ Improvements in gas meters.” These are in dry gas meters which work “ each with one flexible partition,” and in such manner that the flexible material “ is only bent on one surface, in contradistinction to those gas meters, where only one partition is employed, and the flexible material thereof passes through and through the plane of attachment of the flexible material, so that the flexible material used is bent on both surfaces,” and consists in “ combining with the use of such description of single partition meters. An apparatus for working the valves which depends for its action on the use of tumblers so formed that on being moved to a point just beyond the horizontal or central position, the tumbler will fall by its own gravity, and instantly change the position of the valve.”

[Printed, 1s. Drawings. See London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 393; Patent Journal, vol. 1, p. 418; Engineers' and Architects' Journal, vol. 10, p. 91.]

A.D. 1848, September 14.—N^o 12,268.

WINFIELD, ROBERT WALTER, and WARD, JOHN.—“ Improvements in the manufacture of tubes and in the manufacture of certain articles made in part of tubes.” These are in reference to this subject in “ the use of double tubes of brass for the manufacture of gas fittings.” These tubes are made as follows:—“ The said tubes are separately formed by the ordinary manner, and one of the said tubes being placed within the other, the compound tube, with or without a mandril in its interior, is passed through a draw plate, so as to draw the outer upon the inner tube.”

[Printed, 6d. Drawing. See London Journal (*Newton's*), vol. 34 (*conjoined series*), p. 181; Mechanics' Magazine, vol. 50, p. 200; Artizan, vol. 7, p. 208; Patent Journal, vol. 6, p. 235; Engineers' and Architects' Journal, vol. 13, p. 113.]

A.D. 1848, December 28.—N^o 12,392.

POOLE, MOSES.—(*A communication.*)—“ Improvements in the manufacture of heels for boots and shoes, or swivels of bag

“fastenings, of revolving furniture, and of the connections of pipes for gas and other fluids.” These are, in reference to this subject, in the connections of pipes for gas, “making such fastenings of male and female screws, so formed and combined that the male screw having passed through the female screw the stem of the male screw shall alone remain in the female screw; the thread or worm of the male screw then acting as a stop to prevent the return of the male screw out of the female screw, unless the two screws are acted on in a direction to separate them, combined with a back movement.”

[Printed, 8d. Drawing. See *Mechanics' Magazine*, vol. 51, p. 16; *Repertory of Arts*, vol. 14 (*enlarged series*), p. 351.]

A.D. 1854, July 20.—N° 1590.

SUDBURY, JOHN, and WRIGHT, SAMUEL.—“Improvements in taps and valves, and in the method of working them for the purpose of regulating the passage of fluids.” For regulating the passage of gas, on the top of the main supplying the gas is a cup or chamber having a pipe from the main up its centre, this cup is filled with water or other fluid and an inverted chamber or holder is placed over the pipe, this holder is suspended from a lever above moving on a fixed fulcrum. This lever is jointed to another lever mounted on a fulcrum on the main, which lever again is connected with a valve in the main. The valve opens by moving or rising parallel from the seat to which it is fitted, and to ensure “that the opening and closing shall be gradual, without making any alteration in the movement of the valve;” “we extend a solid piece of metal from the under side of the valve, which piece fills up the passage in the seat, but allows the valve to rise freely from its seat. To provide a passage for the fluid we cut angular notches in the piece of metal in the direction of the motion of the valve.”

In another mode for regulating the passage of the gas, “the water cup, main, and valve are all as before described,” but in this case the holder is connected to the valve by a rod which actuates a bell crank lever, the lower end of which takes into the stem of the valve.

[Printed, 8d. Drawing.]

A.D. 1854, August 24.—N^o. 1862.

FONTAINEMOREAU, PETER ARMAND le Comte de.—(*A communication.*)—"Improvements in apparatus for illuminating." These are, in reference to this subject, in gas lamps; suppose the burner to be of porcelain, one inch diameter at its upper part, with about forty holes; place upon the round plate which unites the burner to the chimney a small annular grating, and place on the chimney a cap "the upper part of which is parallel to the porcelain burner, and being slightly conical in about one-third of an inch of its height only, affords to the air in this part a passage of about one-eighth of an inch in thickness." "I also employ a glass tube, having an internal diameter at bottom of one and three-quarter inches and two inches at top, and 6 inches in height." "I make a cylinder of tin of about $1\frac{1}{2}$ inches diameter and $\frac{1}{2}$ inch in height terminating underneath in a horizontal disc of about 2 inches in diameter, which by means of an opening in its centre descends to the small plate with claws and then intercepts the passage of the external current. To this disc are soldered three small bands of tin, bent so as to permit them to be fixed under the claws. To the upper part of the cylinder is soldered another cylinder, pierced with small holes forming the prolongation of the first. It consists of a rather fine wire gauze of about two-thirds of an inch in height, upon the top of which is fixed a small horizontal disc having an opening of about an inch by $1\frac{1}{4}$ inches in diameter in its centre," "this disc is about one-eighth of an inch above the upper part of the burner." "A chimney of about 4 inches high and having an internal diameter of $1\frac{1}{4}$ inches, but rather narrower at top than at bottom, is fixed" by two small hooks, and is moveable upwards and downwards.

"I take a butterfly burner of the size of the largest Manchester burners and employ a socket of thin metal (copper for example), of about an inch in length which may be fitted upon it closely, and upon the upper end of which is soldered the middle of a horizontal tube flattened vertically, of about 3 inches in length, having on its upper part and along almost the whole of its length a great number of small holes, very close to each other, equal in size and equal distances apart, placed horizontally in one straight line, and of about one-thirtieth of an inch in diameter, through which the gas is to pass on the gas being turned

600 THE PRODUCTION AND APPLICATIONS OF GAS.

“ on. Under the tube and horizontally, I solder a piece of fine
“ wire gauze of about four inches in length by about two inches
“ in width. Upon this I place a chimney of about five inches in
“ height, the horizontal section being about the same dimensions
“ as the gauze, and the top of which may be covered or not with
“ a protector cap.”

[Printed, 8d. Drawing.]

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ERRATA IN PART I.

Since the publication of the first volume of the present series of Abridgments the following errata have been discovered therein:—

- Page 1, line 2 from top, *for* "Serle" *read* "Searle."
 Page 2, line 3 from bottom, *for* "Van Haake," *read* "Van Haacke."
 Page 34, line 2 from top, *for* "Gibbins" *read* "Gibbons."
 Page 45, line 2 from top, *for* "Mackintosh" *read* "Macintosh."
 Page 49, line 5 from bottom, *for* "Barnard, Henry Brook" *read* "Brook, Barnard Henry."
 Page 53, line 5 from bottom, *for* "Crossley" *read* "Crosley."
 Page 64, line 20 from top, *for* "Hutchinson," *read* "Hutchison."
 Page 85, line 10 from bottom, *for* "Hadden" *read* "Haddan."
 Page 104, line 14 from top, *for* "Baker" *read* "Barker."
 Page 110, line 2 from bottom, *for* "Hompeah" *read* "Hompesch."
 Page 121, line 16 from bottom, *for* "Crutchell" *read* "Crutchett."
 Page 123, line 17 from top, *for* "Pelletam" *read* "Pelletan."
 Page 150, line 12 from bottom, *for* "Hutchinson" *read* "Hutchison."
 Page 161, line 7 from bottom, *for* "Dickinson, Thomas Friend, *read* "Dickinson, Thomas Friend, and Falkous, John."
 Page 190, line 14 from bottom, *for* "Crossley" *read* "Crosley."
 Page 237, line 13 from top, *for* "Kirkman, John, and Kirkman, Thomas Nesham" *read* "Kirkham, John, and Dirkham, Thomas Nesham."
 Page 280, line 4 from bottom, *for* "Martin" *read* "Marten."
 Page 336, line 7 from bottom, *for* "Jeaks" *read* "Jeakes."
 Page 338, *dele* Abridgment of Stevens' invention, which belongs to the year 1853, *see* page 290.
 Page 348, line 5 from bottom, *for* "coal coal" *read* "coal gas."
 Page 383, line 18 from bottom, *for* "Hyam, Jacob Hyams" *read* "Hyams, Hyam Jacob."
 Page 393, line 13 from bottom, *for* "Bachoffner" *read* "Bachhoffner."
 Page 420, line 14 from top, *for* "Bachoffner" *read* "Bachhoffner."
 Page 450, line 16 from top, *for* "Breedon, Joseph, and Breedon, William" *read* "Breedon, Joseph, and Breedon, William."
 Page 454, line 1 *for* "No. 1352" *read* "No. 1353."
 Page 464, line 14 from bottom, *for* "Keoch, Henry, and Keoch, Ffrench Augustus" *read* "Keogh, Henry, and Keogh, Ffrench Augustus."
 Page 480, line 11 from top, *for* "Herbert, William Hart" *read* "Hart, Herbert William."
 Page 510, line 7 from bottom, *for* "No. 1817" *read* "No. 1878."
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